ENVIRONMENTAL ASSESSMENT

for

the Proposed Ditch Construction along US-2 Between Brevoort Campground Road and Pointe Aux Chenes In Moran Township, Mackinac County, Michigan

Prepared by the:

MICHIGAN DEPARTMENT OF TRANSPORTATION

In cooperation with the

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

August 13, 2007

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APPROVED:

8/13/2007
Date

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PREFACE

The National Environmental Policy Act (NEPA) of 1969 requires that the social, economic, and natural environmental impacts of any proposed action of the federal government be analyzed for decision-making and public information purposes. There are three classes of action. Class I Actions, which are those that may significantly affect the environment, require the preparation of an Environmental Impact Statement (EIS). Class II Actions (categorical exclusions) are those that do not individually or cumulatively have a significant effect on the environment and do not require the preparation of an EIS or an Environmental Assessment (EA). Class III Actions are those for which the significance of impacts is not clearly established. Class III Actions require the preparation of an EA to determine the significance of impacts and the appropriate environmental document to be prepared, either an EIS or a Finding of No Significant Impact (FONSI).

This document is an Environmental Assessment for the proposed ditch construction along US-2 between Brevoort Campground Road and Pointe Aux Chenes in Moran Township, Mackinac County, Michigan. It describes and analyzes construction alternatives, potential impacts, and the measures taken to minimize harm to the project area. It will be distributed to the public and to various federal, state, and local agencies for review and comment. A formal public hearing on this project will then be offered. If review and comment by the public and interested agencies support the determination of "no significant impact", this EA will be forwarded to the Federal Highway Administration (FHWA) with a recommendation that a FONSI be issued. If it is determined that the preferred alternative will have significant impacts that cannot be mitigated, the preparation of an EIS will be required.

This document was prepared by the Environmental Section of the Michigan Department of Transportation (MDOT), in cooperation with the Federal Highway Administration (FHWA) and other members of the US-2 ditch construction project study team. The study team includes representatives from the following areas within the Michigan Department of Transportation: Design, Project Planning, Real Estate, Construction and Technology, Traffic and Safety, and the Superior Region. Information contained in this Environmental Assessment was also furnished by other federal and state agencies, local units of government, public interest groups, and individual citizens.

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SECTION 1

PROPOSED PROJECT

1.1 INTRODUCTION

Proposed Project Area

The Michigan Department of Transportation (MDOT) proposes the following project in Moran Township, Mackinac County, Michigan. The project begins on US-2 approximately 1 mile east of Brevoort Campground Road (County Road 526), then south easterly approximately 4.07 miles (See Exhibit 1.1 - Project Location Map). This area is primarily rural and the project work areas do not contain any residences or businesses. Commuters primarily travel along US-2 between St Ignace and Brevort for employment, retail, work, and recreation activities.

Existing Conditions

Currently there is a 4.07 mile segment of open dune habitat adjacent to US-2 that has created maintenance challenges due to blowing and drifting sand. This sand quickly accumulates on the paved shoulder of US-2 due to the lack of a maintained ditch. Without ditches along this portion of US-2, drainage has become a problem causing water ponding on the shoulders and traffic lanes. In many areas, the sand dunes are high enough and adjacent to the paved shoulder of US-2 that snowplows cannot effectively remove snow from the highway during the winter months. This problem becomes worse as winter progresses and there is not enough storage area for the snow due to the height of the dunes and proximity of the dunes to the shoulder, prohibiting removal. This creates ponding water in the spring when the ground is frozen which leads to ice formations on the shoulder and occasionally in the travel lanes, creating unsafe conditions for motorists. The Michigan State Police (Mr. Patrick London), U.S. Forest Service (Mr. Stevan Christiansen), and MDOT (Mr. David Rusch) have acknowledged and documented these safety concerns.

The open dune community throughout this project corridor contains four state and federally listed plant and animal species. These species include:

- Lake Huron Tansy - *Tanacetum huronense* (State Threatened)
- Pitcher's Thistle - *Cirsium pitcheri* (State and Federally Threatened)
- Lake Huron Locust - *Trimerotropis huroniana* (State Threatened)
- Piping Plover - *Charadrius melodus* (State and Federally Endangered)

The highway was created along the Lake Michigan coastline in 1937 and since then sand maintenance has been an ongoing challenge. Over the last 70 years, the blowing sand and lack of ditch maintenance has created large dunes adjacent to US-2. This condition has grown worse as MDOT has continued to remove only the sand that falls upon the paved shoulders based on the existing maintenance permit approved by MDNR.

Proposed Ditch Construction along US-2
Project Location Map

Exhibit 1.1
Project Location Map

In some areas, this has created steep sloped walls of sand, 2 feet to 6 feet tall, adjacent to the shoulder (See Photograph One). These obstructions pose a threat to vehicles and motorists that need to use the paved shoulder in emergencies. As additional sand continues to accumulate, the dune height grows until the angle becomes steep enough that it slumps on to the shoulder. MDOT then removes this sand and transports it to another upland location. This maintenance cycle has continued for decades and promotes dune growth adjacent to US-2.

Due to the close proximity of the dunes adjacent to US-2, clear zone distances are limited in both straight and curved portions of the highway. The MDOT and American Association of State Highway and Transportation officials (AASHTO) Roadside Design Guide have established federally recognized minimum clear zone distance requirements for all roadways. In several areas along US-2 the available distance is below the design specifications and does not provide the proper recovery distance for errant vehicles. Furthermore, the encroachment of the dunes does not allow motorists enough time to react during daily driving situations and emergencies.

Photograph One: This photograph illustrates the current conditions along US-2 and sand accumulation on the paved shoulder causing numerous safety concerns.

1.2 PURPOSE AND NEED FOR THE PROPOSED PROJECT

Purpose of the Proposed Project

The purpose of this proposed project is to enhance safety along the US-2 corridor in close proximity to the open dune communities adjacent to Lake Michigan. The goal is to develop a long-term maintenance plan that meets the safety needs of the motoring public while minimizing impacts to the open dune community and threatened and endangered species. Highway safety has continued to be a concern over the years due to a lack of permitted ditch maintenance adjacent to US-2 throughout the study area. This has restricted the horizontal area adjacent to the paved shoulder where sand can be removed or graded. This has allowed the dunes to grow in height and migrate adjacent to the paved shoulder. This has created several safety concerns including water drainage, ponding, ice formation on the highway, sand accumulation on the shoulder and travel lanes, reduced sight distance for motorists, and difficulty providing snow removal on the highway. This project would develop a safe and efficient transportation maintenance strategy, which effectively addresses traffic and safety concerns created in this unique open dune community.

Need for the Proposed Project

The needs for the proposed project include:

- Provide clean, sand free shoulders and travel lanes on US-2 by creating ditches that provide a place for drifting sand to accumulate.
- Maintain additional drainage off the highway using an open ditch along US-2 to eliminate spring ponding and winter ice formation.
- Provide a safe area for vehicles and motorists to pull off the road in emergencies by eliminating the vertical sloped dunes adjacent to the shoulder of US-2.
- Allow for proper snow removal and storage by increasing the winging area adjacent to the paved shoulder by moving the bottom of the dune slope away from the road seven feet.
- Provide increased MDOT/AASHTO clear zone distances, which will give motorists additional sight and recovery area by moving the backslope of the dunes away from the shoulder of US-2.

1.3 PREFERRED ALTERNATIVE

Preferred Alternative

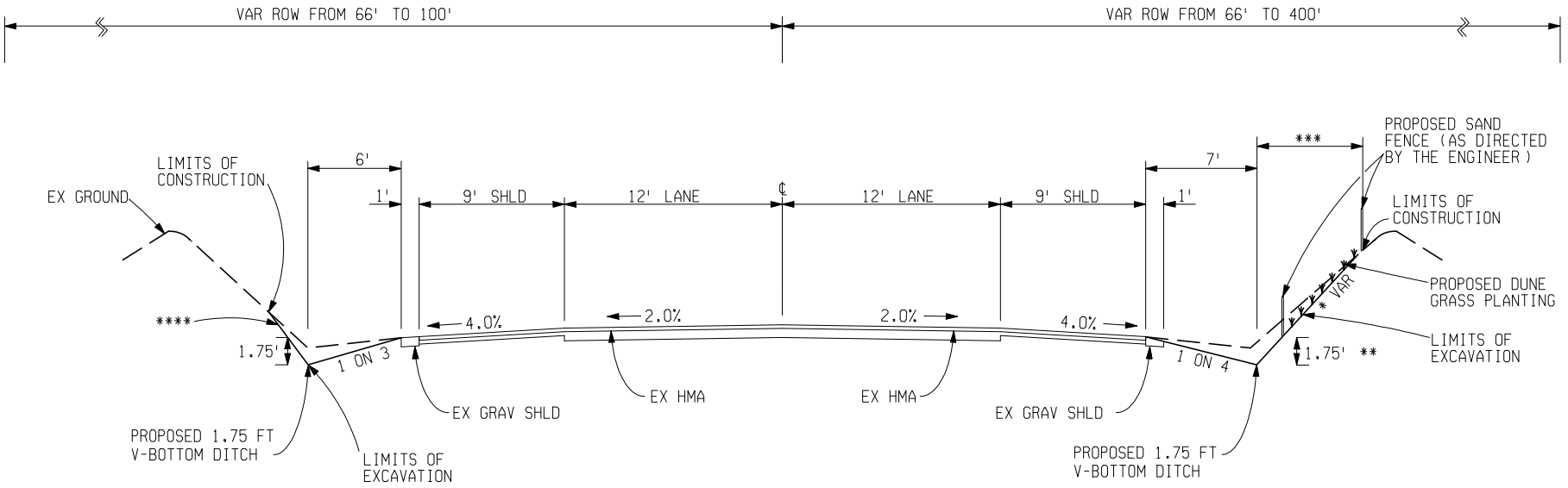
This Preferred Alternative involves the construction of 1.5 miles of linear ditch throughout this 4.07 mile segment and future maintenance of all ditches and graded shoulders within this corridor. A V-bottom ditch would be constructed to a depth of 1.75 ft with 1 on 4 foreslopes (See Photograph Two). Excavation of the ditch would occur from the bottom to the point the backslope stabilizes at the natural angle of repose (slough) for sandy soils. These slopes would then be revegetated with native dune grass and stabilized with temporary sand fence where needed until the dune vegetation has become established. The typical cross-sections, construction limits, design, and ditch profile of this proposed project can be seen in Exhibit 1.2

(Preferred Alternative Cross-Section). MDOT's construction methods would follow the 2003 Standard Specifications for Construction, Special Provisions, Special Details, and/or Standard Plans.

Once the backslopes have been vegetated, sand removal would be required in the spring and fall to maintain proper design profile and ditch function. This excavated sand would be disposed of in upland areas outside of the project limits in areas with existing steep slopes and guardrail. MDOT proposes to complete this five-year maintenance agreement with all of the project partners: MDOT, Michigan Department of Natural Resources (MDNR), Michigan Department of Environmental Quality (MDEQ), United States Fish and Wildlife Service (USFWS) and United States Forest Service (USFS) based on the constraints of the Coastal Zone Management permitting process for sand removal.

The Preferred Alternative as described meets all of the purpose and need criteria, has the lowest environmental impacts to the open dune habitat and threatened and endangered species and will cost the least to build and maintain.

Photograph Two: This is an example of the proposed V-bottom ditch constructed to a depth of 1.75 feet with 1 on 4 foreslopes and the backslope at the natural angle of repose for sandy soils.



PROPOSED CROSS SECTION

(5A) STA 372+20 TO STA 462+80 (LT)
(5C) STA 493+60 TO STA 522+32 (LT)
(5E) STA 525+29 TO STA 576+50 (LT) (POE)
(1) STA 361+51 (POB) TO STA 373+42 (RT)
(3) STA 435+70 TO STA 494+56 (RT)
(4) STA 564+87 TO STA 576+50 (RT)

NO PROPOSED WORK FROM:
STA 361+51 (POB) TO STA 372+20 (LT)
STA 462+80 TO STA 486+70 (LT)
STA 373+42 TO STA 435+70 (RT)
STA 494+56 TO STA 564+87 (RT)

* PROPOSED VARIABLE BACKSLOPE FROM NATURAL ANGLE OF REPOSE TO 1 ON 1

** DUNE GRASS PLANTING SHALL START 1.75 FEET ABOVE DITCH LINE

*** VARIABLE FROM 4 TO 14 FEET FROM DITCH CENTER LINE

**** BACKSLOPE TO MATCH NATURAL ANGLE OF REPOSE OF SAND

Exhibit 1.2
Preferred Alternative

1.4 ALTERNATIVES CONSIDERED AND DISMISSED

No Build Alternative

The No Build Alternative was developed for comparison with the Build Alternatives. The scenario includes no future improvements to the US-2 roadway except for permitted maintenance and sand removal from the travel lanes and shoulders. This alternative will not address the issues presented in the projects Purpose and Need. It is the base condition used for comparison with the other Build Alternatives.

Ditch and Retaining Wall Alternative

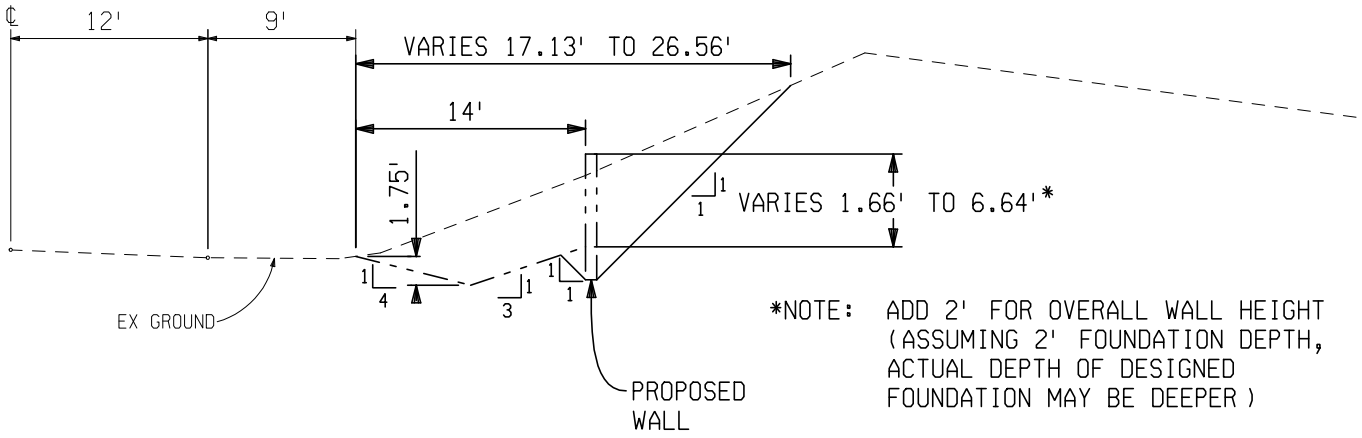
This alternative is comprised of a ditch with a 1 on 4 foreslope and 1 on 3 backslope that tapers upward into a retaining wall running parallel to the highway, 14 feet off the paved shoulder (See Exhibit 1.3 Alternatives Considered and Dismissed). This retaining wall would be used to hold back the dune and sand as it blows inland towards the highway. As sand accumulates within the ditch, it would then be removed twice per year to maintain the profile and function of the ditch.

This alternative was dismissed due to safety concerns associated with the retaining wall. US-2 is posted at 55mph throughout the project area. The retaining wall would be located 14 feet off the paved shoulder and would pose an additional crash hazard in the event that a vehicle loses control and leaves the highway. This alternative would also have greater environmental impacts associated to the dunes and threatened and endangered species due to excavation from 17 to 27 feet off of the paved shoulder. This alternative would also drastically change the aesthetics of the dune habitat adjacent to Lake Michigan. Costs associated with the construction of the retaining wall would be significantly greater than the preferred alternative or standard highway ditch design. Due to these four concerns, this alternative was dismissed from further consideration.

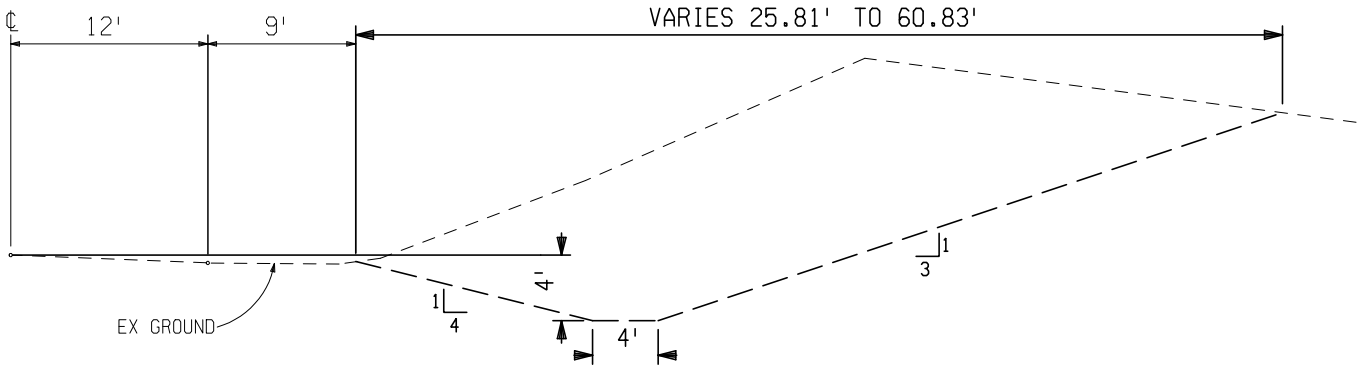
Standard Highway Ditch Alternative

This alternative is comprised of a standard highway ditch design used by MDOT. The ditch profile would be a 1 on 4 foreslope to depth of 4 feet, a 4-foot wide ditch bottom, and a 1 on three backslope (See Exhibit 1.3). The backslope would then be revegetated in the same manner as described in the Preferred Alternative.

This alternative would result in the greatest environmental impacts, as the dunes would require grading between 26 to 61 feet from the edge of the paved shoulder. This would result in the loss of entire dunes adjacent to the highway. Impacts to state and federally listed species would be greatly increased. While this ditch is the preferred standard design, MDOT realizes that a reduced profile as described in the Preferred Alternative will meet the purpose and need of the project. Excavation costs for this alternative would also be considerably higher than the Preferred Alternative. Due to these three concerns, this alternative was dismissed from further consideration.



DITCH AND RETAINING WALL ALTERNATIVE



STANDARD HIGHWAY DITCH ALTERNATIVE

Exhibit 1.3
Alternatives Considered and Dismissed

SECTION 2

AFFECTED ENVIRONMENT, POTENTIAL IMPACTS AND MEASURES TO MITIGATE IMPACTS DURING CONSTRUCTION

As with all proposed projects, MDOT and FHWA have conducted a review of potential social, economic, and environmental impacts associated with the proposed project. Impacts that had a reasonable possibility for individual or cumulative significant impacts were analyzed further. The result of this analysis and measures to minimize short-term impacts during construction are discussed below. Specific mitigation measures are included in the Project Mitigation Summary "Green Sheet" located at the end of this section.

Impacts from construction of the Preferred Alternative would result in a direct taking of 29 Pitcher's thistle plants and approximately 330 ramets (individual shoots in a colony) of Lake Huron Tansy. This taking could potentially be lowered by transplanting these plants into adjacent suitable habitat. Potential impacts to Piping Plover would be minimized by performing work activities when the birds are not present within the project area (late fall). The Lake Huron Locust impacts are harder to access as methods do not currently exist for this type of impact analysis. It is believed that impacts would be low as the gravel and open sand shoulder of US-2 are not habitat for this species. The locust are flushed easily from cover when disturbed, thereby minimizing impacts during construction activities. The newly created ditch and proposed maintenance activities should prohibit this species from colonizing these areas due to lack of suitable habitat.

Short-term impacts to the open dune community would occur due to the removal of sand during construction of the proposed ditches. Creation of the ditch at five locations would cause sand from the highest part of the dune to collapse to the natural angle of repose. Once this occurs, the dunes in these five areas would be 4-6 feet shorter than they currently are (10-14 feet tall). Due to a lack of vegetation the dunes would also be prone to increased erosion and blowing sand adjacent to US-2. Following construction of the ditches and stabilization of the backslope, the dune structure would stabilize behind the maintained ditch. Native dune grass plantings and other erosion control measures would be used to stabilize the disturbed areas.

2.1 RIGHT-OF-WAY IMPACTS/EASEMENTS

The proposed ditch excavation and slope stabilization project along US-2 in Moran Township, Mackinac County, Michigan will require work within the U.S. Forest Service (USFS) right-of-way on both sides of US-2. The Michigan Department of Transportation has permitted ROW from the USFS for a portion of the project limits, which allows MDOT to operate and maintain the highway within the USFS right-of-way. As part of this right-of-way easement, the USFS reserves the right to review MDOT plans and request modifications to the plans for all work within the USFS right-of-way. MDOT has easement ROW from the MDNR at the far eastern end of the project corridor. MDOT will continue to coordinate with the USFS and MDNR and provide the necessary plans for their review and approval.

No displacements or other fee right-of-way or grading permits are required for this project.

2.2 LAND USE AND FARMLANDS

The existing land use within the project area consists of primarily undeveloped rural land with the exception of one business, a local motel. Currently no farmlands exist within the project corridor. The surrounding undeveloped land is predominantly open coastal dune habitat with scattered forestlands. The proposed project will not change land use in the surrounding area and should have no impact on future development or farming patterns.

2.3 INDIRECT AND CUMULATIVE IMPACTS

There appear to be no in-direct impacts created by the proposed project. There have been past sand removal activities throughout the corridor by MDOT. These activities have allowed the excess sand to be removed from the highway in an effort to maintain the travel lanes and shoulders.

This business, a local motel, is located outside the defined work areas but is within the project corridor. While there are some minor temporary impacts created by the scope of this proposed project, these impacts will be mitigated as detailed within the dune restoration and planting plan attached in Appendix C.

2.4 VISUAL CONDITIONS

The proposed ditch construction would not change the overall visual quality of the landscape along US-2. This stretch of roadway, which is part of the Lake Michigan Circle Tour, offers scenic views to residents and tourists alike. Views *from* the road and views *of* the road are dominated by natural landforms. Panoramic views of Lake Michigan to the south and the coastal dunes on either side of US-2 would retain their high-quality aesthetic character. Minor modifications of adjacent coastal dunes will not be readily apparent to most travelers along US-2 or others sharing views of the roadway. It is also important to note that the work will only be performed at five locations, affecting only a small portion of the overall corridor.

2.5 SOCIAL IMPACTS

The proposed project will not cause any long-term negative impacts on any minority, ethnic, low-income, elderly, or handicapped groups, or on area schools, churches, recreation areas, community facilities, or emergency services.

The proposed project will not displace any residential or commercial property owners. Most of the land within the US-2 project corridor is owned by the U.S. Forest Service. However, there is one motel located on the north side of US-2. The proposed ditch excavation and slope stabilization will not affect this property. Access to this property will be maintained during construction and future maintenance activities.

The proposed project is scheduled to be completed in less than 2 weeks. No detours will be required during the construction of this project. Traffic will be maintained on US-2; however, there may be temporary traffic disruptions to motorists, including school buses and emergency service vehicles. MDOT will coordinate with local officials to minimize any traffic disruptions.

2.6 ENVIRONMENTAL JUSTICE

The purpose of Executive Order 12898 on Federal Actions to Address Environmental Justice in Minority and Low-Income Populations is to identify, address, and avoid disproportionately high and adverse human health or environmental effects on minority and low-income populations. After reviewing census data, visual maps, and other related project information, it has been determined that there will be no disproportionately high and adverse human health or environmental effects on minority and low-income populations at this time.

According to the U.S. Census for 2000, the minority population in Moran Township includes: American Indian and Alaska Native (14.2 %), Asian (0.3%), African American (0.5 %), Hispanic or Latino (1.1 %), and Native Hawaiian and Other Pacific Islander (0.1%). The percentage of families below the poverty level in Moran Township is 3.3 percent, while the percentage of families below the poverty level in Mackinac County is 7.2 %. Both of these percentages are less than the state average of 10.5 percent.

The proposed project will not displace any residential or commercial property owners. Most of the land within the US-2 project corridor is owned by the U.S. Forest Service. However, there is one motel located on the north side of US-2 at the west end of the proposed project area. No excavation or slope stabilization will take place on this property. Access for this property will be maintained during construction and future maintenance activities.

The proposed project, when completed, will enhance safety along US-2 by providing cleaner shoulders and travel lanes, better drainage, increased sight and recovery distances, and a safe area for motorists to pull off the road in emergencies.

Although no environmental justice issues are associated with the proposed project at this time, a continuing effort will be made to identify disproportionately high and adverse impacts to minority and low-income populations during subsequent phases of this project. If such impacts are identified, every effort will be made to involve the impacted groups in the project development process, and to avoid, minimize or mitigate these impacts.

2.7 HISTORIC AND ARCHAEOLOGICAL RESOURCES

Above-Ground Historic Resources

There are no National Register of Historic Places (NRHP) eligible or listed above-ground historic resources located within the Area of Potential Effect. for the proposed scope of work. To be eligible for listing on the NRHP the resource must typically be at least fifty years old and meet at least one of the following criteria:

A. They are associated with events that have made a significant contribution to the broad patterns of our history; or

B. That are associated with the lives of persons significant in our past; or

C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. That have yielded or may be likely to yield, information important in prehistory or history.

Archaeological Resources

An archaeological survey was performed in 1978 (Martin and Martin 1979) in the Area of Potential Effect for a previously planned undertaking (i.e., Environmental Assessment for Reconstruction of US-2, M-117 to I-75 in St. Ignace, Mackinac County, Segment 3, 1977) which, while larger in scope, included the same geographic area as this present Environmental Assessment.

In that study, researchers identified and reported the presence of a potentially eligible archaeological site (Brevoort River Site, 20MK105) which is located near the US-2 crossing of the Brevoort River. No other sites were reported and/or are known to be within the Area of Potential Effect for this undertaking.

It is noted that in this present undertakings' scope of work, the Brevoort River Bridge is outside a proposed ditch construction area. Since no work other than maintenance activities will be performed by site 20MK105, impacts to this site will be avoided. Additionally, the State Historic Preservation Office and Office of the State Archaeologist were consulted on this undertaking and concurs with our determinations. Therefore, no historic properties are affected by this undertaking and the Section 106 process for archaeological resources is complete.

Native American Tribal Consultation

Project early coordination letters were sent to the twelve (12) federally recognized Tribes of Michigan seeking comments regarding any issues and/or special concerns relating to this undertaking. Also, there are no known traditional cultural and/or religious properties claimed or reported by any other cultural group within the area of potential effect. Subsequent to these tribal notifications, no requests for consultation or identification of any traditional cultural and/or religious properties were received from any of the twelve federally recognized Tribes. Therefore, since there are no reported impacts to traditional cultural and/or religious properties and no requests for consultation caused by this undertaking regarding any such properties, *no historic properties are affected* and the Section 106 process pertaining to traditional cultural and/or religious properties has been completed.

2.8 THREATENED AND ENDANGERED SPECIES

Threatened and Endangered species are officially protected by the State of Michigan's Natural Resources and Environmental Protection Act, Act 451 of the Public Acts of 1994, Part 365; and the Federal Endangered Species Act of 1973, as amended. An endangered species (E) under the Acts is defined as being in danger of extinction throughout all or a significant portion of its range. A threatened species (T) under the Acts is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Special concern species (SC) are not afforded legal protection under the Acts, but are of concern because of declining or relict populations within Michigan or are species for which more information is needed.

This proposed project traverses four miles of Michigan's open dune community along the north shore of Lake Michigan, which contains four state and/or federally listed plant and animal species. The Michigan Natural Features Inventory (MNFI), Michigan Department of Natural Resources (MDNR) and the U.S. Fish and Wildlife Service (USFWS) were consulted in order to determine the potential for listed species within the project area. The following species were identified within the project corridor that could be potentially affected by the proposed project:

	Common Name	**Scientific Name**	**State Status**	**Federal Status**
•	Pitcher's Thistle	*Cirsium pitcheri*	Threatened	Threatened
•	Lake Huron Tansy	*Tanecetum huronense*	Threatened	Not Listed
•	Piping Plover	*Charadrius melodus*	Endangered	Endangered
•	Lake Huron Locust	*Trimerotropis huronia*	Threatened	Not Listed

The following information provides a general overview of the impacts and mitigation associated with each listed plant and animal species. If additional information is required regarding the impact assessment and mitigation for all species, please request the MDOT Biological Abstract submitted to the USFWS and MDNR. The USFWS Biological Opinion and Incidental Take Statement (Appendix B) also contains a description of the impacts and mitigation for the federally listed species (Pitcher's Thistle and Piping Plover).

An Endangered Species Permit is currently being applied for from the MDNR for all four species listed in this proposed project. It is MDNR's opinion that the project is not likely to jeopardize the continued existence of Piping Plover, Lake Huron Locust, Pitcher's Thistle, and Lake Huron Tansy. The permit will require that the mitigation and monitoring plan be followed as outlined within the Environmental Assessment and Appendix C of this document.

Pitcher's Thistle (*Cirsium pitcheri*)

Impacts

The effects of the proposed action will result in a take of approximately 29 Pitcher's Thistle plants at 16 locations. Of these impacts, 9 of the 29 plants occur within one small area 10ft x 20ft in size. The direct take of these plants represents less than 3-5% of the plants located within the project corridor based on the 2005 survey results.

Habitat for the species will be temporarily disturbed during the construction of the ditches. Following construction, the ditch will be maintained twice each year, which should prevent the plants from becoming established in the maintained bottom. The stabilized top of the backslope would then become the prime habitat within MDOT ROW for this species. This area tended to have the majority of the plants as seen in the 2005 and 2006 field surveys (Schuen, D.).

Potential impacts could also result to other plants and the open dune habitat if invasive species invade the area following construction. Due to the extremely low density of invasives in this corridor, it is believed they will not present a problem during revegetation of the dunes following construction.

Mitigation

The 29 Pitcher's Thistle plants that will be directly impacted during construction are located in a variety of spatial positions within the dune. These plants are difficult to transplant due to the deep taproot and the sandy soils they live in. The taproot of Pitcher's Thistle does not hold the soil together effectively and has made previous transplanting efforts largely ineffective. The USFWS has issued an Incidental Take Statement for 30 individual plants. In an effort to save the plants, MDOT will be transplanting them from the proposed work area to adjacent undisturbed dune habitat within the project corridor. A tree spade will be used to move the entire juvenile plant, its taproot and mass and all of the surrounding soil. This will be accomplished by using a one-yard tree spade that attaches to the front of a large tractor. This will allow the plants to be removed from the preferred habitat (top stabilized portion of the dune) while the tractor remains on the shoulder to eliminate further impacts.

Following restoration and revegetation of the dunes after construction, locally collected Pitcher's Thistle seeds will be used to reseed the impacted areas. Seeds will be collected within the project corridor from 100 mature seed heads at the time of seed dispersal (August). The collected seed will then be distributed throughout the excavated areas and buried one-half inch deep in the sand. The goal is to re-populate these areas as quickly as possible with local and native Pitcher's Thistle seed.

Monitoring

Monitoring the transplanted plants will begin the following summer after construction and will continue for three years to determine survivability and overall health of the plants. A report will be prepared each year detailing the survivability and health of the plants, GPS locations, maps of the mitigation areas and an assessment of the transplanting procedure. This information will be submitted to the MDNR, USFWS and USFS.

The Mitigation and Dune Restoration Plan along with five years of field monitoring will be used to ensure that all areas disturbed are properly revegetated with native dune species. Yearly monitoring will occur to assure that invasives are identified early on and immediately eradicated. This plan will assure that the open dune habitat is fully restored and in a healthy condition at the end of the monitoring period.

Lake Huron Tansy (*Tanecetum huronense*)

Impacts

There are 228 individual ramets of Lake Huron Tansy (nine individual clumps) that would be directly impacted along the south side of US-2 during construction. Additionally, 102 ramets (10 individual clumps) would be directly impacted along the north side of US-2 during construction. These plants are in a variety of different spatial positions within the dune (ditch, slope and top of dune) with the majority (75%) occurring on the foreslope of the dune. The direct take of these plants is less than 1-2 % of those located within the entire project corridor based on the 2005 survey results.

Habitat for the species will be temporarily disturbed during the construction of the ditches. Following construction, the ditch will be maintained twice each year, which should prevent the plants from becoming established in the maintained bottom. The stabilized backslope would then become the prime habitat within MDOT ROW for this species. This area tended to have the majority of the plants as seen in the 2005 and 2006 field surveys (Schuen, D.).

Mitigation

Five of the larger clumps (less than a meter square) contain between 25 to 60 individual ramets per colony. MDOT will transplant these five colonies into suitable undisturbed habitat within the project corridor. A tree spade will be used to move the plant colonies, their root mass and surrounding soil. This will be accomplished by using a one-yard tree spade that attaches to the front of a large tractor. This will allow the plants to be removed from a variety of different positions on the dune while the tractor remains on the shoulder to eliminate further impacts.

Monitoring

Monitoring the transplanted plants will begin the following summer after construction and will continue for three years to determine survivability and overall health of the plants. A report will be prepared each year detailing the survivability and health of the plants, GPS locations, maps of the mitigation areas and an assessment of the transplanting procedure. This information will be submitted to the MDNR, USFWS and USFS.

The Mitigation and Dune Restoration Plan along with five years of field monitoring will be used to ensure that all areas disturbed are properly revegetated with native dune species. Yearly monitoring will occur to assure that invasives are identified early on and immediately eradicated. This plan will assure that the open dune habitat is fully restored and in a healthy condition at the end of the monitoring period.

Piping Plover (*Charadrius melodus*)

Impacts

The proposed construction and maintenance activities will not directly impact this species. The birds' critical habitat, consisting of substrates used for the placement of nests and for foraging, are not found within the project footprint. The selection and occupation of the Pointe aux Chenes nesting site indicates a tolerance for traffic noise and movement. It is unlikely that long-term occupation of this site will continue once lake levels return to average conditions. At that time habitat available for foraging and nest placement will be greatly reduced or eliminated. Long-term indirect impacts to critical habitat are not anticipated based upon observations collected at these sites.

Mitigation

There are no direct impacts to this species or its nesting habitat. Piping Plovers have nested in the same two general areas within the project corridor for the last three years. Due to the Plover's ongoing nesting in these areas, MDOT is committed to a temporary work restriction eliminating all work activities between April 15 and August 31. This is a time when the birds may be nesting and rearing young within the corridor. While the Plover's are outside the directly impacted work area, it is MDOT's goal to reduce secondary impacts (noise, proximity to nest) to the greatest extent.

Monitoring

Monitoring of the Plover's in this area is currently performed by numerous agencies (MDNR, USFWS and USFS) to determine presence/absence of the species. This area will continue to be surveyed by the regulatory agencies for the entire monitoring period associated with this project. These surveys will establish whether the species exists within the project corridor and locations of specific nesting birds. If nesting territories are established the regulatory agencies will delineate the boundaries and install signs and visual fencing to educate the public and designate areas that are off-limits during nesting times. Birds that are actively nesting in the corridor will be protected with exclosures that keep predators from harming the birds or nest. Placement of these exclosures, their setup, maintenance, and removal will be determined and implemented by the regulatory agencies following Piping Plover Recovery Team guidelines.

Lake Huron Locust (*Trimerotropis huronia*)

Impacts

The project falls to the west of Pointe aux Chenes, and locust observations encompass the entire length of the highway in sections 5, 8, 9, 15 and 22 (per MNFI mapping). Since sand blowouts extend across the highway from the foredunes, habitat for this species directly adjacent to the roadway will be impacted at intermittent locations within the project limits.

Mortality of adult locusts due to vehicle strikes had not been previously documented prior to the 2005 MDOT survey. Foraging activity and egg laying in relationship to the existing roadway and shoulders appears absent due to the lack of vegetation.

Maintenance of the road shoulders and roadside ditches will push sand back off portions of the roadway, creating bare and sparsely vegetated sandy areas that may be utilized by this species. This activity maintains existing conditions that have generally persisted since the road was built through the dunes and should not result in any additional threat to the species. Observations made while walking the gravel road shoulders showed that this species avoids the graveled shoulder of the roadway except when flushed from cover. Individual locusts that were flushed from the densely vegetated sandy dune areas by the public to the paved or gravel shoulder, immediately returned to the dunes. This behavior is similar to that reported by Bland (2003) for flights of locusts that over-fly interdunal wetlands of open water.

Mitigation

Since specific mitigation measures for this species have not been identified, restoration of the vegetated dune habitat as quickly as possible seems a logical approach.

Monitoring

Monitoring for Lake Huron Locust will be conducted during the three years after construction to determine the presence or absence of the species within the excavated dune and maintenance areas planted to dune grass. The goal of the surveys will be to determine if the species has recolonized the restored areas. A report will be prepared at the end of each year detailing the local populations, distribution, general health, and discussion of the long-term effects of maintenance adjacent to US-2. This information will be submitted to the MDNR, USFWS, and USFS for their review.

USFS Regional Forest Sensitive Species

In addition to the four state and federally listed plant and animal species listed previously, the USFS also identifies Regional Forest Sensitive Species (RFSS) of special interest. These species include:

Prairie Moonwort	*Botrychium campestre*
Western Moonwort	*Botrychium hesperium*
Spatulate Moonwort	*Botrychium spathulatum*
American Dune Wild-Rye	*Leymus mollis = (Elymus mollis)*
Long-Stalked Stitchwort	*Stellaria longipes*

These species were acknowledged by the USFS during the preliminary planning process in 2004 after being requested by MDOT. It should be noted that *Leymus mollis* has undergone a scientific name change to *Elymus mollis* as indicated by the Michigan Natural Features Inventory abstract for this species and will be referenced by the new species name throughout the remainder of this document.

All three of the Moonwort species have never been located within Mackinac County as indicated by numerous herbarium records, MNFI abstracts and Voss E. G. (Michigan Flora). While these species are suited to living in the dry and sandy dune habitat, they

prefer the perched dunes with canopies and ample ground cover. The open dune habitat within the project corridor does not provide the preferred habitat for these species.

American Dune Wild-Rye has not been located within Mackinac County and is only known to occur on the southern shoreline of Lake Superior. The dune habitat throughout the corridor is suitable for this species, as it prefers open sand dunes and beaches. Long-Stalked Stitchwort is not well adapted to the open dune habitats with their dry sandy soils. It prefers open woodlands with moderate to wet soils. Therefore, the habitat for this species is not present within the project corridor.

The best overlapping survey time for all five of these species is during June as indicated by Wagner and MNFI best survey times. These species were added to the survey list along with the four state and federally listed species also visible at this time. The field surveys for the proposed project were completed in June of 2005 and again in 2006 to assure that all plants were properly located within the corridor. During both surveys, none of these five RFSS were located within the project corridor as defined previously under the survey methodology.

2.9 COASTAL RESOURCES

The State of Michigan regulates sensitive areas along the Great Lakes shore under the Coastal Zone Management program. This program is implemented through various resource protection laws including Part 353 (Sand Dunes Protection and Management); Part 323 (Shorelands Protection and Management) of P.A. 451 (Natural Resources and Environmental Protection), 1994; and P.A. 97-348, 1982, as amended (Coastal Barrier Resources). This project does not fall within the Coastal Zone Boundary or have any impact, direct or indirect to Coastal Barrier Resources or High Risk Erosion Areas. However, there are impacts to Critical Dunes within the project area and MDOT has applied for a Part 353 Critical Dunes Permit from the MDEQ.

The following information provides a general overview of the impacts to the open dune community. Mitigation measures have also been provided that will mitigate for construction related impacts. If additional information is required regarding the impact assessment or mitigation plan for the open dune community, please see Appendix C (US-2 Mitigation and Monitoring Plan).

Impacts

Impacts associated with this project will occur between 0-30 feet from the edge of the travel lane. These impacts are based on excavating sand and forming a ditch 21 inches deep extending approximately 7.0 feet outward from the shoulder point (Preferred Alternative). The back slope of this ditch would be allowed to slump to the natural angle of repose for sand.

Construction width varies greatly throughout the project corridor. Where the side slopes are flatter, impacts are greatly reduced as the back slope will not need to be excavated to construct the ditch. Dunes that are setback from US-2 and have slopes flatter than 45 degrees will have a medium impact since only small amounts of sand will need to be

excavated. Areas that contain steep sloped dunes greater than 45 degrees, adjacent to the travel lane, will have the highest impact. In these areas, 10-20ft of excavation will be required from the edge of the gravel shoulder to create the proposed ditch and stabilize the backslope at the natural angle of repose.

Approximately 20% of the project area will only require a cleanout of the existing ditch to bring it within design specifications. Another 30% of the project area will require small modifications to the backslope consisting of cutting in a few feet (low impact). Approximately 25% of the project area will require excavation work out to 10 feet from the edge of the shoulder (medium impact). The remaining 25% occurs in the high impact dune areas with steeper slopes immediately adjacent to US-2. These areas will require cuts out to 20 feet from the edge of the shoulder.

The open dune habitat in these areas ranges from several hundred to 1,000 feet in width. The average area that will be temporarily disturbed to create the ditch represents <5% of the overall community. The condition of the surrounding habitat within the corridor appears excellent. Natural ecological dune processes appear to be functioning and maintaining the open dune community in good overall health. No invasive plant species other than a few isolated spotted knapweed plants are present within the corridor. While USFWS have noted the species in the area, MDOT did not record any during their survey of the construction corridor. Additionally, other forms of woody encroachment do not appear to be a problem in this area.

Mitigation

Dune Grass Planting

Work shall consist of planting native dune grass (*Ammophila sp.*) plants from commercial sources in Michigan to stabilize the areas where ditch construction has occurred. The grass shall be planted randomly, as per detail, along the proposed backslope of the "V" bottom ditch across from and above the shoulder hinge point to the top of the proposed backslope, as per typical, and in any other areas where natural vegetation has been disturbed from the construction of the ditch. Dune grass planting shall occur no more than three days after ditch excavation is complete.

Sand Fence

Work shall consist of placing sand fence to stabilize the areas of ditch construction. Sand Fence will be placed, as directed by the Engineer, and left in place until natural stabilization by vegetation has occurred.

Contingency Plan

The following items of work shall be done in necessary maintenance situations that arise from the ditch backslope becoming unstable due to natural movement of the sand during the life of the project. Items of work to stabilize trouble areas shall include additional dune grass planting, watering, compacting, erection of additional sand fence, placement of

mulch blanket, and additional earth excavation where ditches have become filled in.

Monitoring

The scope of services for the restoration and monitoring of the open dune community and control of invasive plant species is detailed in Appendix C (US-2 Mitigation and Monitoring Plan). This restoration and monitoring work will be completed by a consultant for MDOT. The scope of services for this contract is also included in Appendix C.

2.10 STREAM CROSSINGS

Stream Crossing Description

The Brevoort River is located 6.9 miles southeast of Brevort, is the only stream crossing within the project limits. This river, is approximately 9.8 miles long and has a drainage area of approximately 29 square miles, and drains southwest from Brevoort Lake then crosses US-2 prior to outletting to Lake Michigan. The Brevoort River is approximately 30 feet wide near the US-2 crossing location.

The Brevoort River is crossed by only one structure within the project area. The existing structure along US-2 was constructed in 1935 and is a 55 foot single span steel bridge with a concrete deck approximately 38 feet wide. The scope of the proposed project does not include any work on this structure.

Stream Crossing Impacts

Drainage courses at the river crossing will not be altered to change the flow of water. No water is discharged into the river at this location. Due to the limited scope of the proposed project, no adverse environmental impacts are anticipated at the US-2 crossing of the Brevoort River.

2.11 WATER QUALITY

Watershed Description

The Brevoort River is located in the Brevoort-Millecoquins Watershed. This watershed covers approximately 578 square miles and includes approximately 102 miles of Lake Michigan shoreline, approximately 19 square miles of inland lakes and 301 miles of streams and rivers. The largest portion of the watershed is contained within Mackinac and Schoolcraft Counties. The Brevoort and Millecoquins Rivers are the major rivers in this watershed. They, along with many other small coastal streams from the Mackinac Bridge to the town of Manistique, are protected for coldwater fish species. Land cover for this watershed is mostly forest (45.4%) and wetlands (40.5%) with only 0.3% considered developed. The Hiawatha National Forest and the Lake Superior State Forest make up a significant portion of the watershed.

Watershed Issues

The MDEQ surveyed the Brevoort River in 2002 as part of the Surface Water Quality Assessment Program. This river was found to fully support its state designated uses including total body contact recreation, a coldwater fishery, and fish consumption. Within the remainder of the Brevoort-Millecoquins Watershed, there are three water bodies that are listed as impaired (303d listed) by the MDEQ and U.S. EPA: Millecoquins Lake, Gulliver Lake, and Milakokia Lake. These water bodies are listed as impaired due to levels of mercury found in fish tissue. The source of mercury contamination is thought to be atmospheric deposition. These three impaired water bodies are not within or near the proposed project area.

Soil Erosion and Sedimentation Control During Construction

MDOT has on file with MDEQ an approved, operating erosion and sedimentation control (SESC) program which ensures compliance with Part 91, Soil Erosion and Sedimentation Control of Act 451, as amended. The MDOT has been designated an "Authorized Public Agency" by the MDEQ and is self-regulated in its efforts to comply with Part 91. However, the MDEQ may inspect and enforce soil erosion and sedimentation control practices during construction to ensure that the MDOT and the contractor are in compliance with Part 91 and the acceptable erosion and sedimentation control program. Given the soil characteristics within the project limits (coarse sand) and the flat ditch grade, storm water is expected to infiltrate quickly into the ground with minimal potential for soil erosion and sedimentation to occur. In the event that any soil erosion and sedimentation develops during construction, SESC Best Management Practices will be placed as directed by the engineer. These SESC measures could include sediment traps, permeable runoff structures, and maintenance to remove any build up of sediment from these measures.

Project Impacts

Due to its scope and location, this project is not anticipated to result in any adverse impacts to the water quality of the Brevoort-Millecoquins Watershed, the Brevoort River, or Lake Michigan.

Creating open ditches for conveyance of storm water runoff is considered a Best Management Practice by MDOT and MDEQ for protection of water quality. For this particular project, providing open ditches along the roadside will be an improvement over the existing conditions of water ponding on the pavement. Use of open ditches to collect stormwater runoff will provide an area where storm water can collect and infiltrate into the ground.

2.12 FISHERIES AND WILDLIFE

Fisheries

The Brevoort River supports cold water fisheries habitat and is listed by the Michigan Department of Natural Resources as a Designated Trout Stream. This river contains significant populations of steelhead trout (*Oncorhynchus mykiss*) and Chinook salmon (*Oncorhynchus tshawytscha*) and is readily fishable due to it larger size.

In October of 2006, personnel from the U.S. Fish and Wildlife Service conducted a sea lamprey population estimate and treated the Brevoort River with a lampricide to reduce the population of these parasitic species in order to aid restoration efforts for lake trout in the Great Lakes.

This project, due to its scope and location, is not anticipated to result in any adverse impacts to the fisheries resources of the Brevoort-Millecoquins Watershed, the Brevoort River, or Lake Michigan.

Wildlife

A total of 18 bird species were documented on surveys conducted on 6 days in May, June, and August of 2005 and 2006. With the exception of two pairs of nesting Piping Plover in the dune area within the project limits, no other nesting birds, denning mammals, or other vertebrates were observed. Evidence of transient use of mammals was restricted to a single set of mustelid tracks found along the vegetated edge of the fore-dune.

Within the project limits use of the critical dune area by birds is associated with post-breeding dispersal loafing and foraging. Gulls, primarily Ring-billed and Herring (*Larus delawarensis and L. argentatus*, respectively), Caspian and Common terns (*Sterna caspia* and *L. hirundo*) represent birds using the beach as loafing sites or as off-shore transients. Incidental use by other avian species included the observation of foraging by Common Raven (*Corvus corax* and American Crow (*C. brachyrhychos*). A Common Raven was observed foraging at the vegetated edge of the fore-dune on 29 June 2006.

The roadway travel lane and shoulders attract foraging gulls and corvids, with several dead, immature gulls documented while conducting surveys in both 2005 and 2006. The disposal of food items by recreational beach users and the occasional road-killed insect are likely the basis of foraging activity by gulls and crows during the summer months.

Surveys conducted to document the presence of the Lake Huron Locust also resulted in the collection of data on a number of other road-killed insects. Based on the scope of the project and construction methods and time, there will be no impact to wildlife species from this project.

2.13 FLOODPLAINS AND HYDRAULICS

No negative or adverse impacts to floodplains will occur as the roadway is elevated and separated from the Lake Michigan shoreline and is placed behind the fore-dune over most of the project corridor. There will be no work conducted below the Ordinary High Water Mark of the Brevoort River.

2.14 WETLANDS

No coastal or interdunal wetlands occur along the project corridor. The shoreline is characterized as Sand/Gravel Beach, with the elevated dunes between the shoreline and US-2 lacking perched, interdunal wetlands; the same condition exists inland of US-2 well beyond the project footprint. Only along the margins of the Brevoort River are wetland plants encountered that provide a sparse, intermittent collection of wetland plants along the incised banks of the river where sheltered conditions exist.

No negative or adverse impacts to wetland resources will occur as a result of the project based upon the limited scope of ditching and the porous character of the sandy soils.

2.15 NOISE ANALYSIS

The project is located within an undeveloped, rural area and does not involve capacity expansion. Therefore, no noise analysis is required based on the 2003 MDOT Noise Policy, FHWA guidelines, or under regulations based on 23 CFR 772 and specifically 23 CFR 772.5(h) and 23 CFR 772.7(a).

2.16 AIR QUALITY ANALYSIS

The entire project area is in attainment for all National Ambient Air Quality Standard pollutants. The project does not involve capacity expansion therefore; no air quality analysis is required under regulation based on 40 CFR 93.125 and 40 CFR 93.123. Diesel equipment should be in good running order to reduce excessive pollution. Although it is not required until 2010 for off-road diesel vehicles, contractors should consider using low-sulfur grade fuel.

2.17 CONTAMINATED SITES

A general MDEQ database check was conducted to determine if any potential sites of environmental contamination exist that could affect the project's design, cost, or schedule. A general MDEQ database check entailed searching the MDEQ Leaking Underground Storage Tank Site Database; the MDEQ Part 201 Site List Database; and the MDEQ, U.S. Geological Survey, and MSU Institute of Water Research Groundwater Mapping Project Database.

The search identified no potential sites of environmental contamination within or near the project area. These results concurred with the results of an Environmental Study for Project Classification, conducted by the Superior Region Resource Specialist and documented in an August 17, 2004 MDOT Office Memorandum.

If contamination is discovered at any time during the project, all contaminated media (soil and groundwater) will be handled and disposed of appropriately in accordance with state and federal regulations.

2.18 CONSIDERATIONS RELATING TO PEDESTRIANS/NON-MOTORIZED ACCESS

The proposed ditch excavation and slope stabilization within the project corridor will not affect a beachside boardwalk (500 feet long), and three wooden stairways that are located on the south side of US-2. These stairways help visitors from the shoulder of US-2 down to the beach. By keeping pedestrian foot traffic off the open dune habitat, impacts are lowered to the sensitive plant communities and sand dunes. Access to all three stairways and the boardwalk will be maintained at all times throughout the duration of the project and future maintenance activities.

The existing parking areas adjacent to the beach will not require any excavation as they naturally roll away and downward towards Lake Michigan. This provides the proper drainage and snow removal in these areas so additional work is not required. Therefore, parking will remain unchanged in these areas, and pedestrians will not be required to walk through a ditch to access the open beach.

2.19 MAINTAINING TRAFFIC

MDOT has developed a plan to maintain traffic during the excavation and slope stabilization of various ditches within the project corridor. Two-way traffic on US-2 will be maintained at all times during the construction of this project and during future maintenance activities. No detours will be required. Access to the local hotel on the north side of US-2, within the project corridor, will be maintained throughout construction. The Maintaining Traffic Plan (Appendix D) provides detail information regarding lane closures, traffic devices, and other provisions that will be used to maintain traffic.

2.20 MEASURES TO MINIMIZE IMPACTS DURING CONSTRUCTION

The goal of mitigation measures is to preserve, to the greatest extent possible, existing neighborhoods, land use, and resources, while improving transportation. Although some adverse impacts are unavoidable, MDOT through the project development, design, environmental, and construction processes, takes precautions to protect as many social and environmental systems as possible. Specific project mitigation items being considered at this time can be found in the Project Mitigation Summary “Green Sheet” located at the end of this section. The Green Sheet may be modified during the final design, right-of-way acquisition, or construction phases of this project.

Construction activities which include the general mitigation measures listed below are those contained in the 2003 Michigan Standard Specifications for Construction. These measures include:

1. The contractor shall locate all active underground utilities prior to starting work, and shall conduct his operations in such a manner as to ensure that those utilities not requiring relocation will not be disturbed. Relocated utilities may be temporarily interrupted for short time periods.

2. Accelerated erosion and sedimentation caused by highway construction will be controlled before it enters a water body or leaves the highway right-of-way by the placement of temporary or permanent soil erosion and sedimentation control measures. MDOT has developed a series of standard erosion/sedimentation control items to be included on design plans to prevent erosion and sedimentation. The design plans will describe the erosion and sedimentation controls and their locations.

3. All regulations of the MDEQ governing disposal of solid waste must be complied with. When surplus or unsuitable material is to be disposed of outside the right-of-way, the contractor shall obtain and file with MDOT written permission from the owner of the property on which the material is to be placed. If federal funds are used for this project, Executive Order 11990 states that no surplus or unsuitable material is to be permanently disposed of in any public or private wetland area, regardless of size. In addition, no material is to be temporarily disposed of in any wetland, watercourse, or floodplain without prior approval (and permit) by the appropriate resource agencies and the Federal Highway Administration.

4. Disruption of traffic in the construction area will be minimized to the greatest extent possible. Although control of all construction-related inconveniences is not possible, motorist and pedestrian safety will be ensured by signing all construction areas. All lane closures and traffic shifts will be clearly marked. Access will be maintained to adjacent properties during construction to the extent possible.

5. Construction noise will be minimized by measures such as requiring construction equipment to have mufflers, that portable compressors meet federal noise-level standards for that equipment, and that all portable equipment be placed away from or shielded from sensitive noise receptors if possible. All local noise ordinances will be adhered to unless otherwise granted exception by the responsible municipality.

6. During the construction of the project, the contractor will be responsible for adequate dust-control measures so as not to cause detriment to the safety, health, welfare, or comfort of any person, or cause damage to any property, residence, or business.

Design plans will be reviewed by MDOT prior to contract letting in order to incorporate any additional social, economic, or environmental protection items. The construction site will be reviewed to ensure that the mitigation measures proposed are carried out, and to determine if additional protection is required. More mitigation measures may be developed if additional impacts are identified. Specific mitigation items will be included on the design plans and permit applications.

The final mitigation package will be reviewed by MDOT representatives, in cooperation with concerned state, federal, and local agencies. Some changes in the early mitigation concepts discussed in this document may be required when construction begins. These mitigation concepts will be implemented to the extent possible. Where changes are necessary, they will be designed and field reviewed before permits are applied for and construction begins. Changes may also be necessary during the construction phase, but they will reflect the early mitigation intent.

Project Mitigation Summary "Green Sheet" For the Preferred Alternative

August 13, 2007 (Draft)

Environmental Assessment

Proposed Ditch Construction along US-2
Between Brevoort Campground Road and Pointe Aux Chenes
In Moran Township, Mackinaw County, Michigan

This project mitigation summary "Green Sheet" contains the project specific mitigation measures being considered at this time. An updated "Green Sheet" will be prepared and included in the Finding of No Significant Impact (FONSI) for this project. These mitigation items and commitments may be modified during the final design, right-of-way acquisition or construction phases of this project.

I. Social and Economic Environment

a.) Right-Of-Way – MDOT will be working within U.S. Forest Service (USFS) right-of-way and coordination with them will continue through the design phase.

b.) Parking and Access to Commercial Property – Access to the local motel within the project limits will be maintained during construction and future maintenance activities. Access to the existing gravel shoulder parking areas along US-2, the beach boardwalk, and three stairways leading down to the beach will be maintained during construction and future maintenance activities.

c.) Emergency Service Access – US-2 traffic will be maintained during construction. Short delays may occur and MDOT will coordinate with area schools and emergency service providers.

II. Natural Environment

a.) Threatened/Endangered Species – MDOT will implement the Dune Restoration and Monitoring Plan agreed to by the MDNR, USFWS, and USFS. The plan can be found in Appendix C of this Environmental Assessment. The plan contains mitigation measures such as transplanting Pitchers Thistle and Lake Huron Tansy using specific techniques and equipment. No ditch construction or future maintenance will occur between April 15 and August 31 to protect Piping Plover nesting habitat when the species is present within the project corridor. Restoration of the open dune habitat will occur as detailed within the Dune Restoration and Monitoring Plan.

Monitoring of the constructed ditch areas and threatened/endangered species will occur yearly for three growing seasons following construction. This monitoring will assess impacts to affected species and will document the success of the transplanting efforts. The Dune Restoration and Monitoring Plan includes control of invasive plant species, emergency erosion measures, and restoration plan for all dune vegetation.

III. Construction

a.) Maintaining Traffic- Two way traffic will be maintained on US-2 during construction by part-width construction methods which may include temporary lane closures and flagging operations.
b.) Permits- Permits are required from the MDEQ (Critical Dune) and MDNR (Threatened/Endangered Species). No federal permit is required but Formal Section 7 Consultation with the USFWS for federal threatened/endangered species has been completed. A Biological Opinion and incidental take statement has been issued by the USFWS (See Appendix B).

SECTION 3

PUBLIC AND AGENCY INVOLVEMENT

3.1 PUBLIC INVOLVEMENT

- July 2006-Current

  MDOT has maintained a website for the project since the inception in 2006. The website located at: http://www.michigan.gov/mdot/0,1607,7-151-9621_11058_43353---,00.html contains all current project information along with the Project Scoping Document. Project team members and their contact information have also been provided. No comments were received directly from the website information page.

- August 2006

  The USFS held a scoping period for the proposed project. The US-2 scoping document was made available for the public to better understand the project and communicate their concerns and questions to the USFS. Five comments were received for the project during the scoping period.

- November 8, 2006

  MDOT held an open forum style Public Meeting from 3:30-7:00pm.
  During this meeting all project materials, alternatives considered, project plans, mitigation items, schedule, and other information were provided. Three people attended the meeting and provided written comments.

3.2 AGENCY COORDINATION AND PARTICIPATION

- June 2005-Current

  Ongoing coordination and meetings have been held throughout the project with MDOT, MDNR, MDEQ, USFWS, and USFS to discuss project development, alternatives, concerns, and potential impacts associated with the project.

- September 28, 2006

  Early Coordination Letters sent to Public, Resource, and Regulatory Agencies to identify issues and concerns regarding the proposed project and potential impacts. Comments were received from five individuals

- April 2007

  The Section 7 Biological Opinion was issued from the USFWS. It is their opinion that this project is not likely to jeopardize the continued existence of Piping Plover and Pitcher's Thistle. No critical habitat has been designated for either species therefore, none will be affected. An incidental take statement was issued for the proposed action of transplanting (30) individual Pitcher's Thistle plants.

SECTION 4 – PROJECT COSTS

4.1 Project Costs

Project costs have been divided into the following categories and estimated by year (Table 4.1 illustrates the cost breakdown).

	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012
EPE	40000	0	0	0	0	0
PE	10000	0	0	0	0	0
ROW	0	0	0	0	0	0
CON	20000	200000*	0	0	0	0
MON	0	10000	10000	10000	0	10000
MAIN	0	25000	26000	27000	28000	29000

Table 4.1 Cost Breakdown for the US-2 Dune Maintenance and Management Plan

FY - Fiscal Year (October 1 to September 30 each year)
EPE - Early Preliminary Engineering
PE - Preliminary Engineering
ROW - Right-of-Way Acquisition
CON - Construction Costs (2007 Dollars)
MON - Monitoring Mitigation Plan
MAIN - Maintenance Yearly
* Construction Anticipated Oct-Nov, 2007 (FY 2008)

SECTION 5

5.1 CONCLUSION

The Michigan Department of Transportation has reviewed this project for potential impacts on the human and natural environments. Based on the information in this Environmental Assessment, field reviews, and coordination with other agencies and the public, it is anticipated that this project will have no long-term significant negative impacts on the natural or human environment within the project area.

Appendix A

Early Coordination Request Letter And Responses

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

KIRK T. STEUDLE
DIRECTOR

September 28, 2006

Mr. Abdelmoez Abdallah, Division Administator
U.S. Department of Transportation
Federal Highway Administration
315 West Allegan Street, Room 211
Lansing, Michigan 48901

Dear Mr. Abdallah:

US-2 Proposed Ditch Construction – Early Coordination Letter

The Michigan Department of Transportation (MDOT) is preparing an Environmental Assessment to study the proposed ditch construction along US-2, between 1 mile east of Brevort Campground Road (County Road 526), southeasterly 4.07 miles to Pointe Aux Chenes in Moran Township, Mackinaw County, Michigan (See Exhibit One - Project Location Map).

This proposed project involves construction of a V-bottom ditch to a depth of 1.75 ft, with one on four side slopes (See Photograph One). Excavation of the ditch would occur from the bottom to the point the back slope stabilizes, at the natural angle of repose (collapse), for sandy soils (See Exhibit Two – Proposed Cross Section). These slopes would then be re-vegetated with native dune grass and stabilized with temporary sand fence where needed. Once the back-slopes have been vegetated, sand removal would be required in the spring and fall to maintain proper design profile and ditch function.

The purpose of this proposed project is to enhance safety along the US-2 corridor, in close proximity to the open dune communities adjacent to Lake Michigan. The goal is to develop a long-term maintenance plan that meets the safety needs of the motoring public, while minimizing impacts to the open dune community as well as threatened and endangered species. Highway safety has continued to deteriorate over the years, due to a lack of proper ditch maintenance along US-2 (See Photograph Two). This has allowed the dunes to grow in height and migrate adjacent to the paved shoulder. This has created several safety concerns including water drainage, ponding, and ice formation on the highway, reduced or limited sight distance for motorists, and difficulty providing snow removal on the highway. This project would develop a safe and efficient transportation maintenance strategy, which effectively addresses traffic and safety requirements created in this unique open dune community.

Potentially impacted resources would include: Lake Huron tansy - Tanacetum huronense (State Threatened), Pitchers thistle - Cirsium pitcheri (State and Federally Threatened), Lake Huron locust - Trimerotropis huroniana (State Threatened), Piping plover - Charadrius melodus (State and Federally Endangered), and the open dune community. Currently, MDOT is working with the Michigan Department of Natural Resources (MDEQ), United States Fish and Wildlife Service (USFWS), and the United States Forest Service (USFS) to determine the level of impacts. Furthermore, MDOT is undergoing Formal Section 7 Consultation with the USFWS (Pitcher's thistle and piping plover), which will not be concluded until an alternative has been selected, impact analysis is complete, and mitigation items have been addressed.

As part of the early coordination process, the project team is seeking input from interested agencies as well as the general public. We are asking for your comments on this project, for the Environmental Assessment as it relates to specific areas of concern; acceptable methodologies; and mitigation and permitting requirements, which may be necessary for project implementation. If you need additional information or desire a joint field review, please contact David Schuen at (517) 373-3075.

Sincerely,

Margaret M. Barondess

Margaret Barondess, Manager
Environmental Section
Project Planning Division

Enclosures

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

SEP 2 0 2006

REPLY TO THE ATTENTION OF:
B-19J

Lyn Hyslop
Hiawatha National Forest
W1900 West US 2
St. Ignace, Michigan 49781

Re: Scoping Comments on the Proposed Ditch Construction along US-2 between Brevort Campground Road and Pointe Aux Chenes in Moran Township, Mackinac County, Michigan

Dear Ms. Hyslop:

The U.S. Environmental Protection Agency has reviewed the above-mentioned document in accordance with our responsibilities under Section 309 of the Clean Air Act and the national environmental Policy Act. We are pleased to have this opportunity to add our suggestions to this project.

The purpose of the proposed project is to enhance safety along the US-2 corridor where it comes into close proximity to the open dune communities adjacent to Lake Michigan. Highway safety has deteriorated due to a lack of proper ditch maintenance along US-2, allowing the dunes to grow in height and migrate adjacent to the paved shoulder. This activity has created several safety concerns including water drainage, ponding, ice formation on the highway, difficulty removing snowfall, and reduced/limited sight distance for motorists.

Following our review of the scoping document, we suggest the following items be analyzed in the forthcoming Environmental Assessment:

- Discuss how often maintenance activities are expected to be performed and what effect maintenance activities are expected to have on flora and fauna in the work zone;
- Discuss non-native, invasive plant species avoidance and treatment techniques;
- Discuss surveying techniques for threatened or endangered species and timing of such activities to be conducted prior to activities;
- Discuss whether sand fences used to stabilize slopes will impair movement of flora and/or flora;
- Discuss alternatives to construction in the area where 19 Pitcher's thistle plants, a state and federally threatened plant, and approximately 300 ramets of Lake Huron tansy, a state threatened plant, occur;
- If alternatives to construction are not possible in the area where Pitcher's thistle plants and Lake Huron tansies are currently located, discuss loss of suitable habitat for these species and whether suitable habitat can be replaced at another location;
- If alternatives to construction are not possible in the area where Pitcher's thistle plants and Lake Huron tansies are currently located, discuss transplanting and monitoring activities for transplanted fauna;
- Discuss monitoring and replanting activities, if necessary, of native dune grasses used for stabilization; and
- Discuss visual impacts of proposed sand fences.

We appreciate the opportunity to comment on this project during the early stages of development. Please do not hesitate to contact me or Kathleen Kowal of my staff at (312) 353-5206 or via email at kowal.kathleen@epa.gov.

Sincerely,

Kenneth A. Westlake, Chief
NEPA Implementation Section
Office of Science, Ecosystems and Communities

Department of the Army
Detroit District, Corps of Engineers
Regulatory Office
Sault Ste. Marie Field Office
312 West Portage Avenue
Sault Ste. Marie, MI 49783

November 29, 2006

IN REPLY REFER TO

File No. 06-056-077-0

Margaret Barondess, Manager
Michigan Department of Transportation
Environmental Section
Project Planning Division
425 West Ottawa Street
P.O. Box 30050
Lansing, Michigan 48909

Dear Ms. Barondess:

This is in response to your September 28, 2006 letter regarding Department of the Army jurisdiction on the proposed ditch construction along U.S.-2, between one mile east of Brevort Campground Road, southeasterly 4.07 miles to Pointe Aux Chenes near Brevort, Michigan (Sections 5, 8, 9, 16 & 22, Township 41N, Range 5W). We have determined that the property in question does not meet Corps criteria for a wetland and is, therefore, not within Federal jurisdiction. This jurisdiction determination is valid for a period of five (5) years from the date of this letter unless new information warrants revision of the delineation before the expiration date.

Thank you for giving us the opportunity to review this proposal. If you have any questions, please contact me at the above address or telephone (906) 635-3462. Please refer to File Number: 06-056-077-0.

Sincerely,

Sue P. Bright
Biologist
Sault Ste. Marie Field Office

Copy Furnished

Enforcement Branch
MDEQ, Upper Peninsula District Office
Sault Ste. Marie Field Office
MDOT, Schuen

David Schuen - US-2 Proposed Ditch Construction

From: "Striffler, Scot" <Scot.M.Striffler@uscg.mil>
To: <schuend@michigan.gov>
Date: 10/25/2006 8:55AM
Subject: US-2 Proposed Ditch Construction
CC: "Bloom, Robert" <Robert.W.Bloom@uscg.mil>

Mr. Schuen,

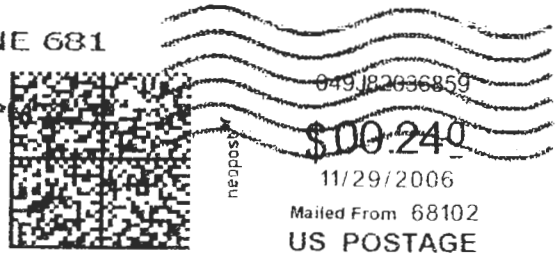
As follow-up to our phone conversation this morning, and in reply to your September 28, 2006, letter regarding the proposed project on US-2 in Moran Township, Mackinaw County, MI, the Coast Guard does not have any permitting or agency coordination requirements for this project. Thank you for the opportunity to review and comment on this proposed project.

v/r
Scot Striffler

Scot M. Striffler
Bridge Management Specialist
Ninth District Bridge Program
Office: (216) 902-6087
Fax: (216) 902-6088
Scot.M.Striffler@uscg.mil

Environmental Coordinator
National Park Service
Midwest Regional Office
601 Riverfront Drive
Omaha, NE 68102

OMAHA NE 681
29 NOV 2006 PM



Margaret Barondess, Manager
Environmental Section
Project Planning Division
Department of Transportation
P.O. Box 30050
Lansing, MI 48909

Re: US – 2 Proposed Ditch Construction, Brevort Campground Road to Pointe Aux Chenes

We have received your letter of September 28, 2006 concerning the above referenced project.

☑ We have no comment on your proposed action.

☑ Please address any further correspondence about this project or any project to the following address:

Regional Environmental Coordinator
National Park Service
Midwest Regional Office
601 Riverfront Drive
Omaha, NE 68102

Due to limited staff and the number of requests we receive for early coordination, we ask that companies/agencies assume we will have no comments on projects if they have not heard from us within 30 days of our receipt of the request.

Thank you,

Regional Environmental Coordinator

United States Department of Agriculture

NRCS

Helping People Help the Land
Natural Resources Conservation Service
3001 Coolidge Road, Suite 250
East Lansing, MI 48823
T (517) 324-5270/ F (517) 324-5171/ www.mi.nrcs.usda.gov

November 3, 2006

Ms. Margaret Barondess, Manager
Environmental Section
Project Planning Division
Michigan Department of Transportation
P.O. Box 30050
Lansing, Michigan 48909

RE: US-2 Proposed Ditch Construction, Mackinaw County Michigan – Early Coordination Letter

Dear Ms. Barondess:

We have reviewed this proposal with respect to its effects on prime and unique soils in forest land and farmland. We have concluded in our study that the proposed ditch construction and reshaping of the banks to the angle of repose along US-2 will not negatively affect the soil resource. Please notify us if there is a change in your proposal.

Sincerely,

JOHN A. BRICKER
State Conservationist

cc:
William Bomier, District Conservationist, NRCS, Sault St. Marie, MI
Michael LaPointe, Area Conservationist, NRCS, Marquette, MI

STATE OF MICHIGAN

JENNIFER M. GRANHOLM
GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
LANSING

REBECCA A. HUMPHRIES
DIRECTOR

October 30, 2006

Ms. Margaret Barondess, Manager
Environmental Section
Project Planning Division
Michigan Department of Transportation
P.O. Box 30050
Lansing, Michigan 48909

Dear Ms. Barondess:

SUBJECT: Proposed Ditch Construction US-2 One Mile East of County Road 526 and Pointe Aux Chenes

Thank you for your letter of September 28, 2006 requesting comments on the proposed project. Ms. Mindy Koch asked me to respond.

The location of the proposed project was checked against known localities for rare species and unique natural features, which are recorded in a statewide database. This continuously updated database is a comprehensive source of information on Michigan's endangered, threatened and special concern species, exemplary natural communities and other unique natural features. Records in the database indicate that a qualified observer has documented the presence of special natural features at a site. The absence of records may mean that a site has not been surveyed. Records may not always be up-to-date. In some cases, the only way to obtain a definitive statement on the presence of rare species is to have a competent biologist perform a field survey.

Under Act 451 of 1994, the Natural Resources and Environmental Protection Act, Part 365, Endangered Species Protection, "a person shall not take, possess, transport, ...fish, plants, and wildlife indigenous to the state and determined to be endangered or threatened," unless first receiving an Endangered Species Permit from the Department of Natural Resources, Wildlife Division. *Responsibility to protect endangered and threatened species is not limited to the list below. Other species may be present that have not been recorded in the database.*

The presence of threatened or endangered species does not preclude activities or development, but may require alterations in the project plan. Special concern species are not protected under endangered species legislation, but recommendations regarding their protection may be provided. Protection of special concern species will help prevent them from declining to the point of being listed as threatened or endangered in the future.

If the project is located on or adjacent to wetlands, lakes, streams, or other regulated resources, additional permits may be required. To obtain more information regarding permits in these areas, please visit the DEQ's website at http://www.michigan.gov/deq. Or you may contact the Michigan Department of Environmental Quality, Land and Water Management Division at 517-241-1515.

The following is a summary of the results for the project in Mackinac County, section 31, T42N R5W and sections 5, 6, 8, 9, 15, 16, 22, T41N R5W.

The following list includes unique features that are known to occur on or near the site(s) and may be impacted by the project. Federally threatened or endangered species are marked with an asterisk (*). Please contact the U.S. Fish and Wildlife Service, 2651 Coolidge Road, Suite 101, East Lansing, MI, 48823 or 517-351-2555 for information on federal regulations that apply to these species.

Common Name	Status	Scientific Name
Pitcher's thistle*	**state, federally threatened**	***Cirsium pitcheri***
Lake Huron locust	**state threatened**	***Trimerotropis huroniana***

Pitcher's thistle has been known to occur in the area and is known to be growing extensively along the shoreline. Pitcher's thistle typically grows on open sand dunes and occasionally on lag gravel associated with dunes. All of its habitats are along the Great Lakes shores, or in very close proximity. Pitcher's thistle often occurs in association with the Great Lakes endemic Houghton's goldenrod *(Solidago houghtonii)* when interdunal wetlands are present.

This monocarpic (once-flowering) plant produces a vigorous rosette that may mature for 5-8 years or more before it flowers. Pitcher's thistle blooms from approximately late-June to early September. Seeds are dispersed individually by wind or as entire flower heads blown across the sand or possibly transported by water. Seeds germinate in June, and most seedlings appear within 1-3 meters of parent plants. The taproot of this thistle, which can reach 2 m in length, enhances its ability to survive the often desiccating conditions of its dune habitat.

Pitcher's thistle can be locally extirpated by destruction or major disturbance of its habitat (e.g. by shoreline development, vehicular or ORV traffic, heavy foot traffic and/or intensive recreation).

The **Lake Huron locust** has been known to occur in section 16, T41N R5W. In Michigan, Lake Huron locust is restricted to sparsely vegetated, high-quality coastal dunes. In these areas, it occurs in high numbers and is always the dominant species. Where the open dunes grade into heavily vegetated or disturbed areas, their numbers quickly decline. Overwintering occurs in the soft dune soil. Nymphs hatch in late spring and mature by mid-July. Adults may be found in large numbers through the fall, most likely succumbing to the first hard frosts.

In general, the project should benefit these species in the long-term. Potential impacts might include direct destruction of species and disturbance of critical habitat. Responses and correspondence can be sent to Ms. Lori Sargent, Natural Heritage Program Specialist, Michigan Department of Natural Resources - Wildlife Division, P.O. Box 30180, Lansing, MI 48909

Thank you for your advance coordination in addressing the protection of Michigan's natural resource heritage. If you have further questions, please call me at 517-373-1263 or e-mail at SargenL2@michigan.gov .

Sincerely,

Lori G. Sargent
Wildlife Division

cc: Mr. Craig Czarnecki, US Fish & Wildlife Service

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF AGRICULTURE
LANSING

MITCH IRWIN
DIRECTOR

October 31, 2006

Ms. Margaret Barondess, Manager
Environmental Section
Project Planning Division
Michigan Department of Transportation
P.O. Box 30050
Lansing, MI 48909

Dear Ms. Barondess:

I received your request for review and comment, as part of the Early Coordination process, for the development of the Environmental Assessment for the proposed US-2 Ditch Construction in Mackinaw County, Michigan. I have reviewed the preliminary plans with Michigan Department of Agriculture staff. It is assumed that all work will take place within already existing MDOT right-of-way. To the best of our knowledge, at this time we do not have any concerns regarding the proposed plan or issues identified as they relate to this project and the functions of the Michigan Department of Agriculture.

We appreciate being included in this Environmental Assessment. Please feel free to contact Abigail Eaton, Resource Specialist at 517/241-3933 if we can be of further assistance on this project.

Sincerely,

Mitch Irwin
Director

STATE OF MICHIGAN
JENNIFER GRANHOLM
GOVERNOR

DEPARTMENT OF HISTORY, ARTS AND LIBRARIES
LANSING

DR. WILLIAM ANDERSON
DIRECTOR

October 30, 2006

MARGARET BARONDESS
MICHIGAN DEPARTMENT OF TRANSPORTATION
425 WEST OTTAWA
PO BOX 30050
LANSING MI 48909

RE: ER07-31 US-2 Ditch Construction, Moran and Brevort Townships, Mackinac County (FHWA)

Dear Ms. Barondess:

The State Historic Preservation Officer (SHPO) received your early coordination notification and request for public comment for the US-2 Ditch Construction project. A review of the file in the Office of the State Archaeologist (OSA) indicates that this stretch of US-2 right-of-way was included in an archaeological survey performed by Michigan Technological University in 1978 (Martin, Susan R. and Patrick E. Martin 1979 Preliminary Archaeological Site Examination of the Proposed Expansion of US-2, Mackinac County, Michigan. Cultural Resource Management Report No. 3. Michigan Technological University, Houghton). This report should be in MDOT's files. Archaeological site 20MK105 was discovered east of US-2 and south of Brevort River. Limited testing done at the time of the survey revealed a buried habitation level .6 to .8 ft below ground level, but the spatial dimensions of the site were not determined (Martin and Martin 1979: 43-44). It is the recommendation of the OSA that additional archaeological testing should be done at this time to determine conclusively the extent of the site and its significance. The 1978 survey reported no other archaeological sites in the stretch of US-2 in question.

We have no comments at with regard to above-ground resources this time. Once the formal Section 106 project information is received in full by the SHPO, we can proceed with the review.

Please note that the Section 106 review process cannot proceed until we are able to consider the information requested above. If you have any questions, please contact Brian Grennell, Environmental Review Specialist, at (517) 335-2721 or by email at ER@michigan.gov. **Please reference our project number in all communication with this office regarding this undertaking.** Thank you for your cooperation.

Sincerely,

Brian D. Conway
State Historic Preservation Officer

BDC:JRH:BGG

STATE OF MICHIGAN
JENNIFER GRANHOLM
GOVERNOR
DEPARTMENT OF HISTORY, ARTS AND LIBRARIES
LANSING
DR. WILLIAM ANDERSON
DIRECTOR

December 1, 2006

FILE COPY

ABDELMOEZ ABDALLA
FEDERAL HIGHWAY ADMINISTRATION
315 W ALLEGAN STREET ROOM 207
LANSING MI 48933

RE: ER07-31 US-2 Ditch Construction, JN877191, CS49023, Moran and Brevort Twps., Mackinac County (FHWA)

Dear Mr. Abdalla:

Under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended, we have reviewed the above-cited undertaking at the location noted above. Based on the information provided for our review, it is the opinion of the State Historic Preservation Officer (SHPO) that **no historic properties are affected** within the area of potential effects of this undertaking.

The views of the public are essential to informed decision making in the Section 106 process. Federal Agency Officials or their delegated authorities must plan to involve the public in a manner that reflects the nature and complexity of the undertaking, its effects on historic properties and other provisions per 36 CFR § 800.2(d). We remind you that Federal Agency Officials or their delegated authorities are required to consult with the appropriate Indian tribe and/or Tribal Historic Preservation Officer (THPO) when the undertaking may occur on or affect any historic properties on tribal lands. **In all cases**, whether the project occurs on tribal lands or not, Federal Agency Officials or their delegated authorities are also required to make a reasonable and good faith effort to identify any Indian tribes or Native Hawaiian organizations that might attach religious and cultural significance to historic properties in the area of potential effects and invite them to be consulting parties per 36 CFR § 800.2(c-f).

This letter evidences the Federal Highway Administration's compliance with 36 CFR § 800.4 "Identification of historic properties", and the fulfillment of the Federal Highway Administration's responsibility to notify the SHPO, as a consulting party in the Section 106 process, under 36 CFR § 800.4(d)(1) "No historic properties affected".

The State Historic Preservation Office is not the office of record for this undertaking. You are therefore asked to maintain a copy of this letter with your environmental review record for this undertaking. If the scope of work changes in any way, or if artifacts or bones are discovered, please notify this office immediately.

If you have any questions, please contact Brian Grennell, Environmental Review Specialist, at (517) 335-2721 or by email at ER@michigan.gov. **Please reference our project number in all communication with this office regarding this undertaking.** Thank you for this opportunity to review and comment, and for your cooperation.

Sincerely,

Martha MacFarlane Faes
Environmental Review Coordinator

for Brian D. Conway
State Historic Preservation Officer

MMF:JRH:cc

Post-it® Fax Note 7671	Date 12/9/07	# of pages ▶ 1
To DAVE RUGGLES	From BRIAN GRENNELL	
Co./Dept. MDOT	Co. SHPO	
Phone #	Phone # 335-2721	
Fax # 373-9255	Fax #	

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

KIRK T. STEUDLE
DIRECTOR

September 28, 2006

Mr. Jim Williams, Jr.
Tribal Chairman
Lac Vieux Desert Band of Lake Superior Chippewa Indians
E 23968 Powwow Trail
Watersmeet, Michigan 49969

Dear Mr. Williams:

US-2 Proposed Ditch Construction – Early Coordination Letter

The Michigan Department of Transportation (MDOT) is preparing an Environmental Assessment to study the proposed ditch construction along US-2, between 1 mile east of Brevort Campground Road (County Road 526), southeasterly 4.07 miles to Pointe Aux Chenes in Moran Township, Mackinaw County, Michigan (See Exhibit One - Project Location Map).

This proposed project involves construction of a V-bottom ditch to a depth of 1.75 ft, with one on four side slopes (See Photograph One). Excavation of the ditch would occur from the bottom to the point the back slope stabilizes, at the natural angle of repose (collapse), for sandy soils (See Exhibit Two – Proposed Cross Section). These slopes would then be re-vegetated with native dune grass and stabilized with temporary sand fence where needed. Once the back-slopes have been vegetated, sand removal would be required in the spring and fall to maintain proper design profile and ditch function.

The purpose of this proposed project is to enhance safety along the US-2 corridor, in close proximity to the open dune communities adjacent to Lake Michigan. The goal is to develop a long-term maintenance plan that meets the safety needs of the motoring public, while minimizing impacts to the open dune community as well as threatened and endangered species. Highway safety has continued to deteriorate over the years, due to a lack of proper ditch maintenance along US-2 (See Photograph Two). This has allowed the dunes to grow in height and migrate adjacent to the paved shoulder. This has created several safety concerns including water drainage, ponding, and ice formation on the highway, reduced or limited sight distance for motorists, and difficulty providing snow removal on the highway. This project would develop a safe and efficient transportation maintenance strategy, which effectively addresses traffic and safety requirements created in this unique open dune community.

Potentially impacted resources would include: Lake Huron tansy - Tanacetum huronense (State Threatened), Pitchers thistle - Cirsium pitcheri (State and Federally Threatened), Lake Huron locust - Trimerotropis huroniana (State Threatened), Piping plover - Charadrius melodus (State and Federally Endangered), and the open dune community. Currently, MDOT is working with the Michigan Department of Natural Resources (MDEQ), United States Fish and Wildlife Service (USFWS), and the United States Forest Service (USFS) to determine the level of impacts. Furthermore, MDOT is undergoing Formal Section 7 Consultation with the USFWS (Pitcher's thistle and piping plover), which will not be concluded until an alternative has been selected, impact analysis is complete, and mitigation items have been addressed.

As part of the early coordination process, the project team is seeking input from interested agencies as well as the general public. We are asking for your comments on this project, for the Environmental Assessment as it relates to specific areas of concern; acceptable methodologies; and mitigation and permitting requirements, which may be necessary for project implementation. If you need additional information or desire a joint field review, please contact David Schuen at (517) 373-3075.

Sincerely,

Margaret M. Barondess

Margaret Barondess, Manager
Environmental Section
Project Planning Division

Enclosures

cc: Mr. George Beck

The Lac View Desert Band of Lake Superior Chippewa Indians have no interest in

Project #: 452 - Dexter Brevort

giiwegiizhigookway Martin/THPO/NAGPRA

10/31/2006

Date

Potentially impacted resources would include: Lake Huron tansy - Tanacetum huronense (State Threatened), Pitchers thistle - Cirsium pitcheri (State and Federally Threatened), Lake Huron locust - Trimerotropis huroniana (State Threatencd), Piping plover - Charadrius melodus (State and Federally Endangered), and the open dune community. Currently, MDOT is working with the Michigan Department of Natural Resources (MDEQ), United States Fish and Wildlife Service (USFWS), and the United States Forest Service (USFS) to determine the level of impacts. Furthermore, MDOT is undergoing Formal Section 7 Consultation with the USFWS (Pitcher's thistle and piping plover), which will not be concluded until an alternative has been selected, impact analysis is complete, and mitigation items have been addressed.

As part of the early coordination process, the project team is seeking input from interested agencies as well as the general public. We are asking for your comments on this project, for the Environmental Assessment as it relates to specific areas of concern; acceptable methodologies; and mitigation and permitting requirements, which may be necessary for project implementation. If you need additional information or desire a joint field review, please contact David Schuen at (517) 373-3075.

Sincerely,

Margaret M. Barondess

Margaret Barondess, Manager
Environmental Section
Project Planning Division

Enclosures

cc: Mr. Jason Ayres

THE KEWEENAW BAY INDIAN COMMUNITY
HAS NO INTEREST IN:
PROJECT #: US-2 Ditch Construction
Summer Cohen
SUMMER COHEN/THPO/NAGPRA
10-23-06
DATE

706 North State Street
St. Ignace, Michigan 49781
Phone: (906) 643-7333
TDD Relay: 1-800-649-3777
Fax: (906) 643-7606
E-mail: mcrc@sault.com

MACKINAC COUNTY ROAD COMMISSION

November 1, 2006

David Schuen
Environmental Section, Project Planning Division
Michigan Dept. of Transportation
PO Box 30050
Lansing, MI 48909

Dear Mr. Schuen:

At their meeting held October 31, 2006, the Mackinac County Road Commission addressed Margaret Barondess' letter of September 28, 2006 regarding US-2 proposed ditch constriction. The Mackinac County Road Commission would like to express their concerns for the safety of the public along the US-2 corridor by restricting the parking along the south side of US-2 by the proposed construction of the ditch adjacent to US-2.

Please call if you have any questions or need additional information.

Sincerely,

Craig J. Kelso, Engineer/Manager

Appendix B

USFWS Biological Opinion

United States Department of the Interior

FISH AND WILDLIFE SERVICE
East Lansing Field Office (ES)
2651 Coolidge Road, Suite 101
East Lansing, Michigan 48823-6316

IN REPLY REFER TO:

April 12, 2007

Mr. James J. Steele
U.S. Department of Transportation
Michigan Division, Federal Highway Administration
315 West Allegan Street
Room 201
Lansing, Michigan 48933

Subject: Biological Opinion, Log No. 06-R3-ELFO-04, for the US-2 Widening Project, Mackinac County, Michigan

Dear Mr. Steele:

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion (Opinion) on the widening of US-2 in Mackinac County, Michigan and its effects on the Pitcher's thistle (*Cirsium pitcheri*). Your initial request for formal consultation was received on March 3, 2006. Upon mutual agreement, the time line for completion of formal consultation was extended so as to coincide with completion of the National Environmental Policy Act (NEPA) process.

This Opinion is based on information provided in the Biological Assessment (BA), the Draft Environmental Assessment, the US-2 Maintenance and Dune Management Plan, site visits, telephone conversations, and other sources of information. A complete administrative record of this consultation is on file at the Service's East Lansing Field Office (ELFO).

Consultation History

June 8, 2005.	Inter-agency meeting held on the proposed US-2 Maintenance and Dune Management Plan.
August 12, 2005.	The Service received the Draft BA for the US-2 project.
October 6, 2005.	The Service provided comments to the Michigan Department of Transportation (MDOT) on the Draft BA.

February 6, 2006.	The Service received a "response to questions raised by both the U.S. Forest Service (USFS) and Service regarding the US-2 Dune Maintenance and Management Plan".
March 3, 2006.	The Service received a request to initiate formal consultation from the Federal Highway Administration (FHWA) for the US-2 project.
April 4, 2006.	The Service received an e-mail from David Schuen of MDOT indicating the August 12, 2005 document and subsequent "response to questions" document constitute the final BA.
April 10, 2006.	The Service responded to the request for formal consultation.
April 28, 2006.	A multi-agency conference call was held to discuss the project status and proposed schedule.
May 25, 2006.	A multi-agency site visit was conducted of the project area in Mackinac County.
July 21, 2006.	A meeting/teleconference was held in East Lansing to discuss the current status of the project and the proposed timeline for completion of the NEPA process and consultation.
August 7, 2006.	The Service, FHWA, and MDOT agreed, via e-mail correspondence, to extend the timeline for formal consultation to November 30, 2006, so as to coincide with the NEPA process. This timeline was dependant on the development of preferred alternative prior to completion of the consultation.
August 14, 2006.	The Service received from MDOT a revised project schedule.
January 23, 2007.	The Service received, via e-mail from MDOT, a description of the preferred alternative, pictures and typical cross-sections.
February 6, 2007.	The Service received additional information on the project from MDOT in response to Service questions on project design and construction.
February 15, 2007.	The Service issued the Draft Biological Opinion on the U.S. 2 project.
March 23, 2007.	The Service received comments on the draft Opinion from MDOT via e-mail.

BIOLOGICAL OPINION

Description of the Proposed Action

Project Description

The proposed project involves construction and maintenance of a ditch along a segment of US-2 in Mackinac County, Michigan (Figure 1).

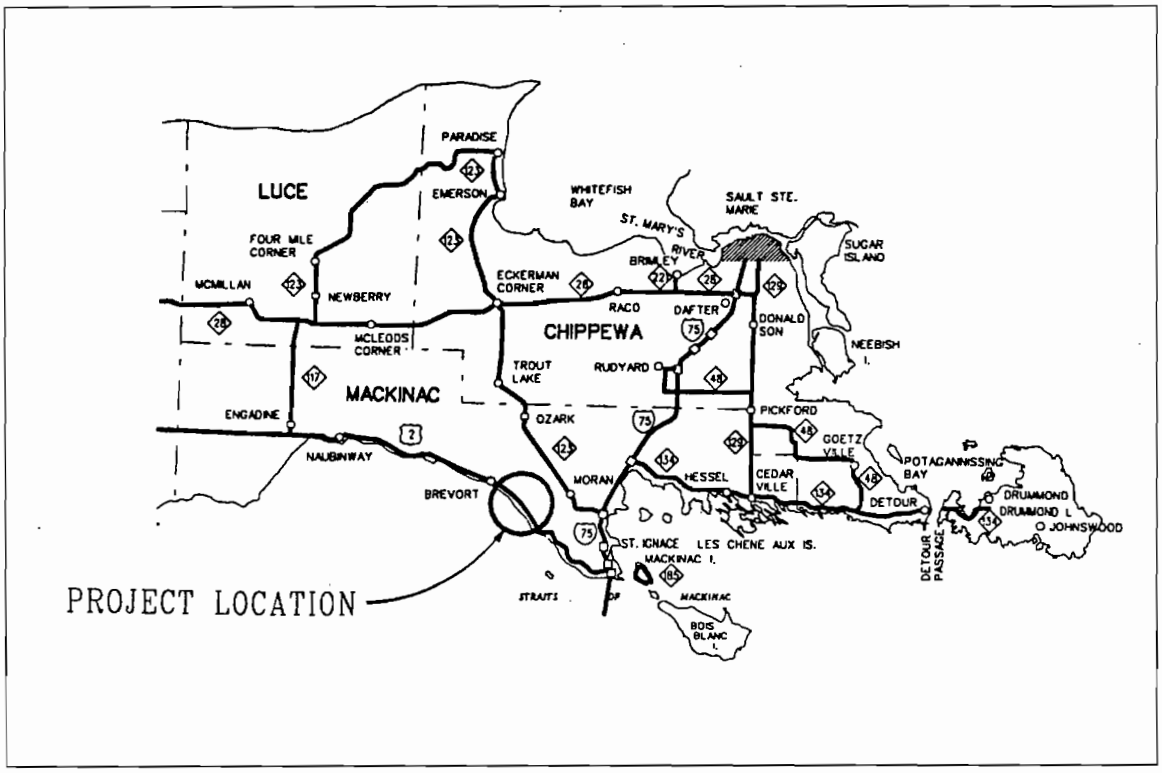


Figure 1 Project Area (Source: MDOT)

The project area begins on US-2 approximately 1 mile east of Brevort Campground Road (County Road 526) in Moran Township and extends south easterly approximately 4.07 miles (Figure 2). A V-bottom ditch would be constructed to a depth of 1.75 ft with 1 on 4 side slopes. Certain areas will be gapped out. No work will be performed in the following areas: Sta 373+42 to Sta 435+70 (RT); Sta 496+56 to Sta 564+87 (RT); Sta 361+51 (POB) to Sta 372+20 (LT); and Sta 462+80 to Sta 486+70 (LT and RT)(Brevort River Bridge).

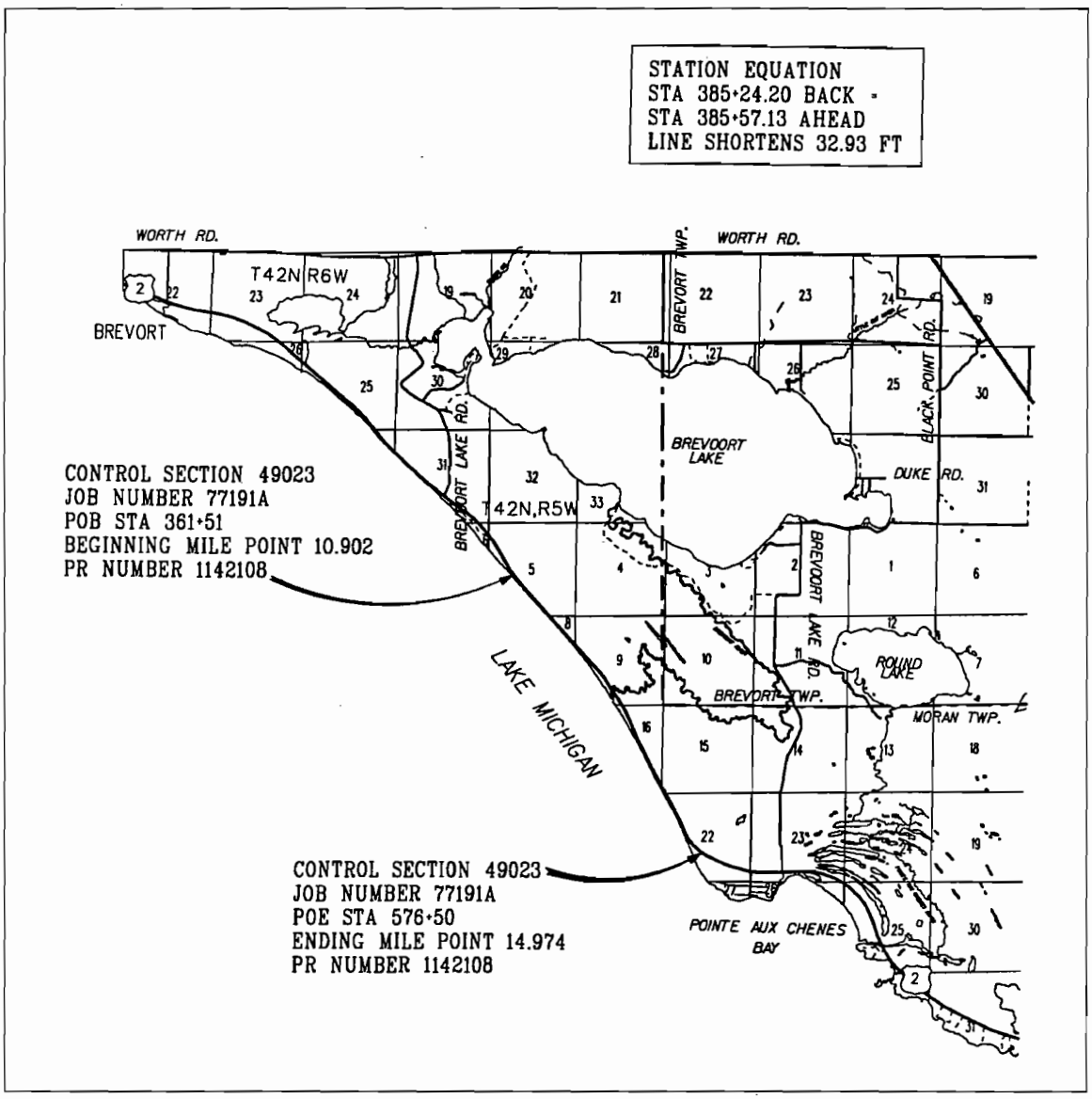


Figure 2 Project Limits (Source: MDOT)

Excavation of the ditch would occur from the bottom to the point the back slope stabilizes at the natural angle of repose (collapse) for sandy soils. These slopes would then be re-vegetated with native dune grass and stabilized with a sand fence where needed. Figure 3 illustrates the typical cross-sections, construction limits, design, and ditch profile of this proposed project. Construction area widths will vary depending on the location, the height of the dunes, and their closeness to the road. MDOT's construction methods would follow their 2003 Standard Specifications for Construction, Special Provisions, Special Details, and/or Standard Plans.

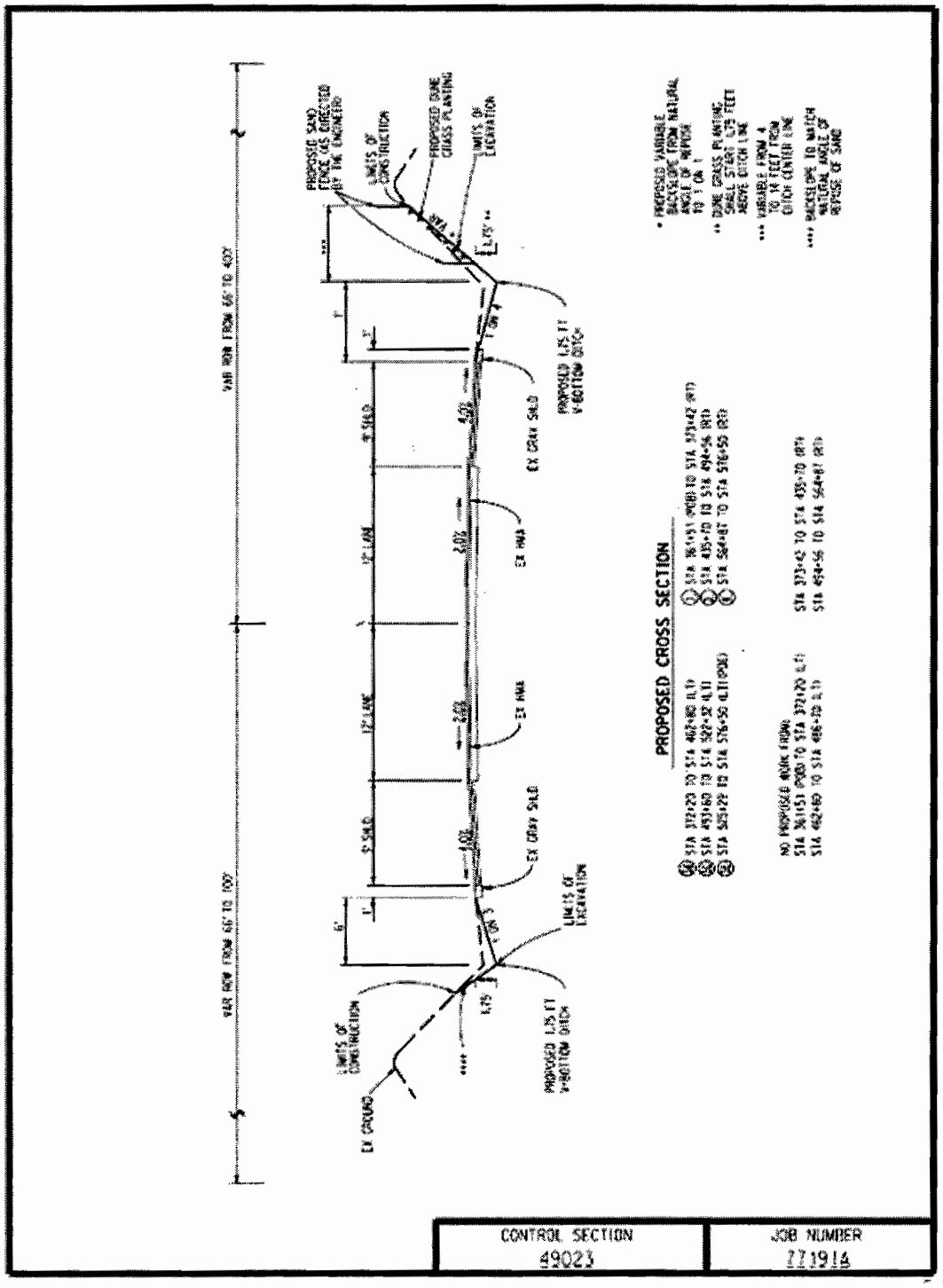


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Figure 3. Typical Cross-section. (Source: MDOT)

Once the back-slopes have been re-vegetated, annual sand removal would be required in the spring and fall to maintain proper design profile and ditch function. The excavated sand would be disposed in upland areas outside of the project limits in areas with existing steep slopes and guardrail. MDOT proposes to make this a five-year maintenance agreement with all of the project partners: MDOT, Michigan Department of Natural Resources (MDNR), Michigan Department of Environmental Quality, United States Fish and Wildlife Service and United States Forest Service, based on the constraints of the Coastal Zone Management permitting process for sand removal.

Implementation of the proposed project will result in adverse effects to the Pitcher's thistle, a plant currently listed as threatened under the Endangered Species Act of 1973, as amended. In response to these impacts and as a component of the project, MDOT has developed a "US-2 Mitigation and Monitoring Plan for Endangered Species and Habitat Restoration" (MDOT January 11, 2007). The plan describes the methods to be employed to transplant individual Pitcher's thistle plants, reseed some impacted areas with locally collected Pitcher's thistle seeds, and conduct long-term monitoring.

Monitoring of transplanted Pitcher's thistle plants will begin at the start of the following growing season—April or May--and will continue for three years. Survivability and overall health of the transplanted individuals will be recorded and summarized in a final report. Monitoring of the construction areas within the project corridor will be conducted the second and fifth year following construction. The objective of this effort is to assess the population size, distribution and health of other individual plants within the general project area. Reports will be prepared at the end of each monitoring period and submitted to the MDNR, USFS, and the Service.

Status of the Species

Species Description and Life History

Pitcher's thistle is a monocarpic (flowers and sets seed only once), perennial, herbaceous plant, generally flowering after a 5-8 year juvenile stage (Loveless 1984). The stems and leaves of juveniles and adults are woolly-white, and the leaves are deeply pinnatifid with the lobes less than 1 centimeter (cm) wide and up to 4 cm long. Minute spines are concentrated along the edge of the leaf at its base, with a few spines between the lobes of the distal leaf margins. The flowering stems are up to 1 meter tall and have several to a dozen widely scattered leaves. Individuals typically have a single branching flowering stem with terminal and axillary flowering heads of a cream or pinkish color. Multiple stemmed plants are known, however, and the number of flowering heads per plant varies with habitat, latitude, plant size and year (Keddy and Keddy 1984, Loveless 1984). Juveniles and adults have a tap root that may reach 2 m in length.

Pitcher's thistle reproduces only sexually. Pollination occurs by several insects, including members of Diptera, Lepidoptera, and Hymenoptera families. Each plant flowers only once and then dies. Seed dispersal commences in late July at the northern limits of its range (Keddy and Keddy 1984), but can occur from June to August

(McEachern 1992). Primary seed dispersal is through individual seeds blowing from the inflorescence head or by whole plant and heads falling to the ground at the end of the flowering season. Secondary dispersal is effected by wind blowing seed and seed heads across the sand, snow or water surface (Loveless 1984). Seed dormancy is broken by cold, moist stratification (Hamzé and Jolls, in press), and germination occurs in May and June (Loveless 1984). Following germination, seedlings appear and produce 1 to 6 leaves (Loveless 1984) in the first season. Seedling densities are greater where bare ground is abundant (McEachern et al. 1989) as compared to stabilized sites with greater vegetation cover.

Juvenile plants typically consist of 1 rosette; but if grazed, trampled or buried, they may develop multiple rosettes (McEachern 1992). Juveniles may remain dormant for one or two years as a result of drought (McEachern 1992). Causes of mortality include human and animal trampling (Keddy and Keddy 1984, Gibson 1988), sand deposition and erosion (McEachern pers. comm., Weller pers. comm.), drought, and rabbit herbivory (Weller pers. comm.). Juveniles grow or maintain a constant size throughout the growing season but may diminish in size over the winter (Loveless 1984, McEachern 1992).

Pitcher's thistle reproduces when plants reach ages that range from 5 to 8 years. Age of reproduction may be correlated with habitat. Loveless (1984) found that adults bloom sooner in more stabilized habitats than in foredunes. What specifically triggers blooming is unknown, but the length of the longest leaf (Loveless 1984) and the root crown diameter (McEachern 1992) were found to be significant predictors. However, flowering probably involves an interaction between plant size (growth rate) and age, as small plants have been observed to flower (Gibson pers. obs., McEachern pers. obs., Pavlovic pers. obs.).

Habitat and Ecology

Pitcher's thistle is one of a few plant species endemic to the post-Wisconsonian Great Lakes sand dunes. It occurs as one member of a dynamic dune ecosystem with a myriad of interacting species. The health of Pitcher's thistle populations indicates the general well being of dune ecosystems. No species is known to depend completely on Pitcher's thistle, but Pitcher's thistle provides a food source (pollen, nectar and seed) for many organisms (Keddy and Keddy 1984, Loveless 1984).

Cirsium pitcheri occurs most frequently in the near-shore plant communities, although it occurs in all non-forested areas of the Great Lakes dune systems. It colonizes patches of open, windblown areas of the landscape, and gradually declines locally as the density of vegetation and ground litter increase through plant succession. *Cirsium pitcheri* depends on a process of continual colonization of the mosaic of open habitats within the Great Lakes dunes. It is patchily distributed with varying population sizes in all open zones of dune vegetation, although its populations decline in stabilized, late successional secondary dune sites and in areas heavily used by the public. *Cirsium pitcheri* density peaks in mid-successional habitats and requires 70% open sand for successful seedling establishment and survival (McEachern 1992).

For a particular occurrence of Pitcher's thistle to survive, disturbance must be frequent enough to prevent extirpation from succession and infrequent enough to allow juveniles to reach maturity; thus, the Pitcher's thistle life history is finely tuned to a specific disturbance regime (McEachern 1992). Disturbances may eliminate local occurrences, but as long as those disturbances are not synchronous throughout the landscape and occurrence creation exceeds decline, the species will persist (Pavlovic 1994).

Pitcher's thistle depends on the geomorphic processes that maintain dune systems to create sparsely vegetated habitats where successful population establishment and growth can occur. In the past, disturbance and successional processes maintained shifting dunes and produced a mosaic of sites suitable and unsuitable for Pitcher's thistle. The mosaic changed over time, but suitable habitat was available at all times. In any occupied site, as dune succession proceeds, increased vegetation cover and litter reduce the Pitcher's thistle germination and survival. Thus, as succession makes present-day habitat unsuitable, existing population patches will eventually be locally extirpated from the areas they now occupy. For the species to persist, new open habitats relatively near to existing occurrences and patches must be continuously created for Pitcher's thistle to colonize.

Status and Distribution

Pitcher's thistle is endemic to the beaches and grassland dunes of Lakes Michigan, Superior, and Huron (Guire and Voss 1963), with the majority of known sites occurring along the shores of Lake Michigan. The species ranges from the north shore of Lake Superior south to Indiana, and formerly occurred in northern Illinois, where it is has been experimentally reintroduced (Bowles et al. 1992, Bowles et al. 1993, Bowles and McBride 1993 & 1994, Bowles and Bell 1998). It is also distributed along the Lake Michigan shoreline in Wisconsin. In the east, it ranges through northern Lake Huron to the Manitoulin Island archipelago and southern Georgian Bay in Ontario.

One hundred and sixty-eight historic and existing occurrences are known in the United States, but 7 have been extirpated. Pitcher's thistle probably occurred more commonly along the Great Lakes shorelines prior to European settlement, but it is unknown how many occurrences were lost prior to settlement and shoreline development. Most of the known extirpated occurrences are in Illinois and in Indiana.

The 161 currently known occurrences are found in Michigan, Indiana and Wisconsin, with 145 (91%) of these occurrences in Michigan. Seventy-seven percent of the occurrences are in the Lake Michigan basin, with the bulk of the remainder in the Lake Huron basin. Eighty-seven (54%) populations are in public ownership. The 73 remaining (45%) are in private ownership.

Pitcher's thistle is found at 145 locations in Michigan. The Upper Peninsula (U.P.) of Michigan supports 38 sites, most along the North Shore of Lake Michigan on simple linear dune systems. Fourteen of the 38 locations are found in Mackinac County, the most of any U.P. county. Other U.P. counties known to support Picher's thistle include Schoolcraft, Chippewa, Delta, and Alger.

Environmental Baseline

The environmental baseline includes past and ongoing natural factors, and past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal section 7 consultation, and the impact of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a basis to assess the effect of the project.

The Service recognizes the action area (the area that may be directly or indirectly affected by the proposed action) to be the 4.07 mile US-2 project corridor, including areas several feet from the travel lanes. The exact width of the impact area will vary along the length of the roadway, depending on location, height of the dunes and the distance from the road edge to the dune.

Status of the Species Within the Action Area

Mackinac County, Michigan, where the project is located, is known to contain fourteen occurrences of Pitcher's thistle. One of these occurrences, the Hiawatha National Forest Dune site, is within the project area. This site has an elemental occurrence rank of A as determined by the Michigan Natural Features Inventory (MNFI). The occurrence ranks were assigned on the basis of the quality of the plant community and on the size and apparent condition of individuals as well as age structure of the occurrence. Plant community quality is determined by the level of human disturbance and the condition of the plant community structure and composition. An "A" rank is given to sites with an extensive dune system that has not been altered significantly and may harbor several thousand individuals.

MNFI also uses a size class ranking system, assigning values from one to five, based on the areal extent of the occurrence and the abundance of the species. Lower ranks have larger areal extent and larger populations. The Hiawatha National Forest Dune site is ranked 1. Size class 1 occurrences are typically greater than 500 acres with an abundance of plants considered common or better (>10,000).

A field survey of the project area was conducted by MDOT staff on 17-18 June, 2005. Biologists traversed an area 40 feet from the travel lane, counted individual plants, and mapped each location with GPS. Twenty-nine individual plants, nine of which occur in one clump, were found within the area subject to impacts from the proposed ditching and long-term maintenance. Although data on the total number of individuals found within the project area was not provided in MDOT's Biological Assessment, they conclude the number of Pitcher's thistle to be impacted represents less than 3-5% of the total population in the project corridor.

Factors Affecting the Species Environment Within the Action Area

Other past and ongoing human and natural events in the area which pose potential adverse effects on the Pitcher's thistle include:

- Invasions of non-native plants. Invasive species such as spotted knapweed are present in the project area and may pose a threat to Pitcher's thistle habitat.

- Recreational human use. Foot traffic, which occurs in the project area, may destabilize substrates and alter habitat. Direct trampling of individual plants is also possible.

- Lake level fluctuations. Increases in lake levels, which may occur in the future, may restrict foredune habitat and storm events may lead to blowouts.

On March 2, 2006, the FWS completed a programmatic formal consultation with the Hiawatha National Forest on the implementation of their Land and Resource Management Plan (Forest Plan) (USDAFS 2005). The Forest Plan includes management of Pitcher's thistle, including the subject section of the US-2 corridor which occurs on the Hiawatha. The Hiawatha determined that implementation of the Forest Plan is likely to adversely impact Pitcher's thistle due to recreational activities. In its programmatic biological opinion (USFWS 2006), the FWS concluded that recreational impacts were likely to result in take of individual Pitcher's thistle and its habitat, but that these impacts should not reach a level that would jeopardize the continued existence of the species.

Effects of the Action

Factors Considered

Proximity of the action

The proposed project is within an area occupied by several Pitcher's thistle plants. In addition, an area of open dune habitat containing many other Pitcher's thistle plants, as well as other rare species, occurs in the immediate vicinity of project corridor.

Distribution

The US-2 project consists of ditching and maintenance along a linear corridor of approximately 4 miles. Portions of the project area will be subject to more sand movement and disturbance than others, based on the current dune profile and proximity of high dunes to the roadway.

Timing

Most of the work associated with the US-2 project will be timed to avoid adverse effects to the Great Lakes piping plover, which is present in the area from April to early September each year. Timing of project activities, however, has little effect on the level of impact to Pitcher's thistle. Pitcher's thistle is a perennial plant, with individuals having a life span of 5-8 years.

Nature of the Effect

The project will directly affect the survival of approximately 30 individual plants, as they will be removed from the project impact area prior to construction. The exact number will be dependant on the number of individuals alive within the impact area at the time of transplanting. Effects will be in the form of manual excavation, removal, and transplanting of individual plants located within the construction area. Efforts will be made to transplant each of the affected individuals to other areas of suitable habitat, but their long-term survival is uncertain. Continued annual maintenance activities are likely to preclude the establishment of additional plants in this area and reduce the potential for any future impacts to individual Pitcher's thistle plants.

Duration

MDOT proposes to make this a five-year maintenance agreement with all of the project partners: MDOT, MDNR, MDEQ, USFS, and the Service.

Analyses for Effects of the Action

Beneficial Effects

Removal of non-native clays and gravel, control of exotic species, and re-contouring of the site may help return the area to a more native state and improve future habitat conditions for other Pitcher's thistle plants in the project area.

Direct Effects

The proposed project involves construction of a ditch along a 4.07 mile segment of US-2 in Mackinaw County. A V-bottom ditch will be constructed to a depth of 1.75 ft with 1 on 4 side slopes. Excavation of the ditch would occur from the bottom to the point the back slope stabilizes at the natural angle of repose (collapse) for sandy soils. This action will occur in an area occupied by 30 individual Pitcher's thistle plants, as determined by field surveys in 2006. All individuals located within the construction area will be transplanted to a nearby location. The exact number of transplanted individuals may vary from 20 to 50 depending on the number of plants alive at the time of project initiation.

The transplantation of up to a maximum of 50 plants at the restoration site will not affect any other populations within the range of the species. Other plants currently growing outside the site should not be affected. It is likely that some of the transplanted plants will not survive the relocation. Unknown problems with equipment or weather during the transplant could affect results. In spite of the risks and uncertainties for this proposed action, it is clear that absent any effort to save the identified plants by transplantation, they would likely be destroyed during construction.

Indirect Effects

Indirect effects are those resulting from the proposed action, are later in time, and are reasonably certain to occur. The construction and maintenance of the proposed ditching project along US-2 is not expected to result in increased commercial or residential development, or increased pedestrian use of the area. Recreational use of the area, which may impact Pitcher's thistle, is already present and is not expected to increase as a result of the project. Continued maintenance of the ditch, which will be conducted on a bi-annual basis, is expected to preclude the establishment of any new Pitcher's thistle plants and eliminate additional impacts in the future. Indirect effects are, therefore, not anticipated.

Species' response to the proposed action

Adverse effects to the species are not expected outside of the construction area. The action is highly unlikely to cause a non-recoverable decline of the species in Michigan or throughout its range. Re-vegetated side slopes may provide future habitat for Pitcher's thistle. The potential for establishment will be augmented by a re-seeding effort, using locally collected Pitcher's thistle seeds. The potential success of this effort is uncertain, however, as little information is available on the viability of manual seeding efforts.

The response of the species to the transplanting effort is also uncertain. Information on the success of previous transplant efforts is limited. A reintroduction of Pitcher's thistle into suitable habitat at Illinois Beach State Park was undertaken by Bowles in 1991. In the first year, all introduced plants were greenhouse grown from seed collected in Wisconsin, Indiana, and southwest Michigan. In 1993, seeds were also directly planted at the site. Survival for all years was lowest in the first year after planting (0 to 50%). All 1996 transplants were killed by the 1996 August drought. For all years, cohort survival varied from 0 to 23%.

Cumulative Effects

No other known state, local or private actions are planned which may affect this species in the action area and vicinity. Therefore, there are no cumulative effects to consider at this project site.

Conclusion

After reviewing the current status of *Cirsium pitcheri*, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the species. No critical habitat has been designated for this species, therefore, none will be affected.

Up to 50 individual Pitcher's thistle plants will be taken as a result of the project. Efforts will be made by MDOT to transplant each of these individuals to other areas of suitable habitat in the project area. Transplanting of these individuals, however, may result in some loss. Under the worst case scenario, up to 50 plants may be lost. Given the number of plants estimated to be present within the US-2 project area, the loss of fifty individuals is not expected to jeopardize the continued existence of the sub-population within the action area, or the population as a whole in the Great Lakes.

Since we have concluded a no-jeopardy opinion, the identification and implementation of reasonable and prudent alternatives to avoid jeopardy are not relevant. We have identified discretionary actions that the Michigan Department of Transportation can implement with respect to the proposed action, in partial fulfillment of the FHWA's Section 7 (a)(1) responsibilities.

Incidental Take Statement

Section 9 of the Act, as amended, prohibits any taking of listed species without special exemption. Sections 7(b)(4) and 7(o)(2) of the Act exempts taking that is incidental to and not intended as part of an agency's action, as long as that taking complies with the terms and conditions of an Incidental Take Statement.

Sections 7(b)(4) and 7(o)(2) of the Act, however, generally do not apply to listed plants species. Protection of listed plants is provided to the extent that the Act requires a Federal permit for removal or reduction to possession of endangered plants from areas under Federal jurisdiction, or any act that would remove, cut, dig up, or damage or destroy any such species on any other areas in knowing violation of any regulation of any State or in the course of any violation of a State criminal trespass law. Regulations (50 CFR 17.71) extend protection to threatened plants as well, but with limitations. As Pitcher's thistle is currently listed threatened under the Act, the proposed action of transplanting up to fifty (50) individuals would not require the Section 7(o)(2) exemption provided by an Incidental Take Statement.

Conservation Recommendations

Section 7 (a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency actions

to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

We recommend the FHWA in cooperation with MDOT consider the following conservation measures which are consistent with the Recovery Plan:

A. Measures to minimize adverse effects to the Pitcher's thistle.

1. When transplanting individuals, dig out the entire root ball, wrap the root ball in burlap and move the plant to the new, pre-dug hole. Fall and winter periods are more conducive to transplanting.

2. During restoration efforts, assure protection of existing individuals by clearly marking plant locations and directing activities away from these areas.

3. Monitor the survival of transplanted juvenile plants for a period of five years. Information on survival rates of transplanted juveniles, whether or not they reach the adult flowering stage, would benefit future researchers and managers.

B. Efforts to promote long-term conservation of the species within the project area.

1. Promote public awareness of Great Lakes dune ecology and the species that inhabit them through signs, kiosks and other educational tools.

2. Use all feasible measures to direct public foot traffic to defined trails.

3. Evaluate and control, to the degree possible, invasive dune species within the project area.

Reinitiation Notice

This concludes formal consultation on the action. In accordance with 50 CFR 402.16, reinitiation of formal consultation is required where Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded, (2) new information reveals that the agency action may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the agency action is subsequently modified in a manner that causes an adverse effect to the listed species not considered in this opinion, or (4) a new species is listed or critical habitat is designated that may be affected by the action.

We look forward to future cooperation with the FHWA to conserve our Nation's threatened and endangered species. Should there be questions, please contact Mr. Jack Dingledine of this office, at 517-351-6320.

Sincerely,

for Craig Czarnecki
Field Supervisor

cc: Margaret Barondess, Michigan Department of Transportation, Lansing, MI
Todd Hogrefe, Michigan Department of Natural Resources, Lansing, MI

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Appendix C

US-2 Mitigation and Monitoring Plan

US-2 Mitigation and Monitoring Plan
Endangered Species and Habitat Restoration

Introduction

This project traverses four miles of Michigan's open dune community along the north shore of Lake Michigan, which contains four state and/or federally listed plant and animal species. These species include: Pitchers Thistle, Lake Huron Tansy, Lake Huron Locust, and Piping Plover. This mitigation and monitoring plan has been designed to minimize impacts to these listed species and the open dune community. The document outlines the project and impacts that will occur as a result of construction. In order to minimize impacts to these species and their supporting habitats, MDOT proposes on-site mitigation within the project limits. No construction activities would be allowed until all mitigation items outlined below have been satisfied.

Impacts to plant species will be short-term while the habitat is disturbed during construction of the ditch. There will be a direct taking of approximately 19 clumps of Lake Huron Tansy totaling 330 individual shoots. Additionally, 29 Pitchers Thistle plants will be taken, 9 of which occur in one location. These plants represent a small portion of the local populations which will not be significantly impacted by this project.

Based on the limits of earth work and temporal work restrictions in place during the nesting period, the Piping Plover will not be adversely affected. Lake Huron Locust is located throughout the project corridor. While this species and its eggs will be directly impacted by the construction of the ditch we are unable to determine the extent of these impacts. Population data for this species and techniques to access the level of impact do not exist at this time. It is known that this species is prolific throughout the entire US-2 corridor where open dunes persist.

Table of Contents

SECTION 1

General Project Information

1.1 Project location

Control Section 49023, Job Number 77191A begins on US-2 approximately 1 mile east of Brevoort Campground Road (County Road 526) at the P.O.B., Station 361+51 (M.P. 10.902), Moran Township, Mackinac County, thence south easterly approximately 4.07 miles to the P.O.E., Station 576+50 (M.P. 14.974), Moran Township, Mackinac County.

1.2 Description of work

Work includes maintaining traffic, excavation of a 1.75 ft V-bottom ditch, planting of native dune grass, and erection of sand fence to stabilize the disturbed area between the US-2 roadway within the construction limits as shown on the typical cross-sections. The back slope will be excavated from the bottom of the ditch to the natural angle of repose for sandy soils. The ditch will then be revegetated with native plant material to stabilize the soil to restore the open dune community. The work is being done to restore surface drainage and to maintain clear zones. The above work items will be constructed according to the 2003 Standard Specifications, Special Provisions, Special Details, and/or Standard Plans.

1.3 Gapped Areas

Certain areas of this project have been gapped out for ditch construction. No ditch construction work will be performed in the following areas:

Sta 373+42 to Sta 435+70 (RT)
Sta 496+56 to Sta 564+87 (RT)
Sta 361+51 (POB) to Sta 372+20 (LT)
Sta 462+80 to Sta 486+70 (LT and RT) (Brevort River Bridge)

Many of these areas already have existing ditches or naturally drain away from the highway therefore, no additional work is required.

1.4 Yearly Maintenance

Once the ditches have been created, the entire 4.1 mile corridor will meet the purpose and need described in section one of the Environmental Assessment. Yearly maintenance work will be performed throughout the entire 4.1 mile corridor to maintain the design profile as specified. That work will include ditch cleanout (sand removal) and grading of the gravel shoulders as needed. Due to migrating sand, this work may be required several times a year to maintain the design profile. Early spring and late fall will be peak maintenance times, while avoiding the piping plover work restriction period cited below.

Once the backslopes have been vegetated, sand removal from the ditch will be required in the spring and fall to maintain the ditch profile. This sand will be removed and disposed of outside the project area to avoid additional impacts. MDOT proposes to make this a 5-year maintenance agreement with all of the project partners based on the constraints of the Coastal Zone Management permitting process.

Due to the Plover's ongoing nesting in these areas, MDOT is committed to a temporary work restriction eliminating all work activities between April 15 and August 31 including all future maintenance activities. This is a time when the birds may be nesting and rearing young within the corridor. While the Plover's are outside the directly impacted work area, it is MDOT's goal to reduce secondary impacts (noise, proximity to nest) to the greatest extent.

SECTION 2

Pitchers Thistle (Cirsium pitcheri)

2.1 Impacts

The effects of the proposed action will result in a take of approximately 29 Pitchers thistle plants at 16 locations. Of these impacts, 9 of the 29 plants occur within one small area 10ft x 20ft in size. The direct take of these plants represents less than 3-5% of the plants located within the project corridor based on the 2005 survey results.

Habitat for the species will be temporarily disturbed during the construction of the ditches. Following construction, the ditch will be maintained twice each year, which should prevent the plants from becoming reestablished in the bottom of the ditch. The stabilized top of the backslope would then become the prime habitat within MDOT ROW for this species as they tend to occupy the tops of dunes (Schuen).

Potential impacts could also result to other plants and the open dune habitat if invasive species invade the area following construction. Due to the extremely low density of invasives in this corridor, it is believed they will not present a problem during revegetation of the dunes following construction.

2.2 Mitigation

The 29 Pitchers Thistle plants that will be directly impacted during construction will be transplanted prior to any work activities. These plants are difficult to transplant due to the deep taproot and the sandy soils they live in. The taproot of Pitchers Thistle does not hold the soils together effectively and has made previous transplanting efforts largely ineffective. The USFWS has issued an Incidental Take Statement for 50 individual plants.

In an effort to save the plants, MDOT will be transplanting them from the proposed work area to adjacent undisturbed dune habitat within the project corridor. A tree spade will be used to move the entire juvenile plant, its taproot and mass and all of the surrounding soil. This will be accomplished by using a one yard tree spade that attaches to the front of a large tractor. This will allow the plants to be removed from a variety of different positions on the dune while remaining on the shoulder to eliminate further impacts.

Transplanting Procedure:

1. The transplant receiving hole will be dug with the tree spade.
2. The soils surrounding the plant to be moved will be saturated with water for 3’ wide x 3’ length x 3’ deep. This will help to bind the sandy soils together while they are moved in an effort to minimize impacts to the plant root and soil structure.

3. The plant and surrounding soils will then be picked up with the tree spade and moved into the receiving hole. The remaining hole will then be filled in with the soil from the receiving hole.
4. Following transplanting, all plants should be immediately watered again to help compact the sandy soils and eliminate potential air pockets.

By using a one yard bucket, our maintenance operators feel they can move the soil and plants with a minimal amount of disturbance to the roots. A practice session using several test holes will be conducted before attempting to work with the Pitchers Thistle plants. This will help build the skills of the transplanting team and allow an opportunity to make small corrections to the procedure before working with the listed species. Following transplanting the plants will be marked and watered weekly until November 15 (watering during freezing temperatures should be avoided unless directed by engineer).

Following restoration and revegation of the dunes after construction, locally collected Pitchers thistle seeds will be used to reseed the impacted areas. Seeds will be collected within the project corridor from 100 seed heads at the time of seed dispersal (August). The collected seed will then be distributed throughout the excavated areas and buried one-half inch deep in the sand. The goal is to re-populate these areas as quickly as possible with local and native Pitchers thistle seed.

2.3 Monitoring

Monitoring the transplanted plants will begin the following summer after construction and will continue for three years to determine survivability and overall health of the plants. A report will be prepared each year detailing the survivability and health of the plants, GPS locations, maps of the mitigation areas and an assessment of the transplanting procedure. This information will be submitted to the MDNR, USFWS and USFS.

The Mitigation and Dune Restoration Plan along with five-years of field monitoring will be used to ensure that all areas disturbed are properly revegetated with native dune species. Yearly monitoring will occur to assure that invasives are identified early on and immediately eradicated. This plan will assure that the open dune habitat is fully restored and in a healthy condition at the end of the five-year monitoring period.

SECTION 3

Lake Huron Tansy (Tanecetum huronense)

3.1 Impacts

There are 228 individual ramets of Lake Huron Tansy (nine individual clumps) that would be directly impacted along the south side of US-2 during construction. Additionally, 102 ramets (10 individual clumps) would be directly impacted along the north side of US-2 during construction. These plants are in a variety of different spatial positions within the dune (ditch, slope and top of dune) with the majority (75%) occurring on the foreslope of the dune. The direct take of these plants is less than 1-2 % of those located within the entire project corridor based on the 2005 survey results.

Habitat supporting this species will be temporarily disturbed during the construction of the ditches. Following construction, the ditch will be maintained twice each year, which should prevent the plants from becoming reestablished in the bottom of the ditch. The stabilized backslope would then be the prime habitat within MDOT ROW for this species as they prefer the steeper sloped areas and not the top of the dune (Schuen).

Potential impacts could also result to other plants and the open dune habitat if invasive species invade the area following construction. Due to the extremely low density of invasives in this corridor, it is believed they will not present a problem during revegetation of the dunes following construction.

3.2 Mitigation

Five of the larger clumps (less than a meter square) contain between 25 to 60 individual ramets per colony. MDOT will transplant these five colonies into suitable undisturbed habitat within the project corridor. A tree spade will be used to move the plant colonies, their root mass and surrounding soil. This will be accomplished by using a one-yard tree spade that attaches to the front of a large tractor. This will allow the plants to be removed from a variety of different positions on the dune while remaining on the shoulder to eliminate further impacts. Please reference the transplanting procedure under Section 1, mitigation, for further details.

3.3 Monitoring

Monitoring the transplanted plants will begin the following summer after construction and will continue for three years to determine survivability and overall health of the plants. A report will be prepared each year detailing the survivability and health of the plants, GPS locations, maps of the mitigation areas and an assessment of the transplanting procedure. This information will be submitted to the MDNR, USFWS and USFS.
The Mitigation and Dune Restoration Plan along with five-years of field monitoring will be used to ensure that all areas disturbed are properly revegetated with native dune

species. Yearly monitoring will occur to assure that invasives are identified early on and immediately eradicated. This plan will assure that the open dune habitat is fully restored and in a healthy condition at the end of the five-year monitoring period.

SECTION 4

Piping Plover (Charadrius melodus)

4.1 Impacts

The proposed construction and maintenance activities will not directly impact this species. The birds' critical habitat, consisting of substrates used for the placement of nests and for foraging, are not found within the project footprint. The selection and occupation of the Pointe aux Chenes nesting site indicates a tolerance for traffic noise and movement. It is unlikely that long-term occupation of this site will continue once lake levels return to average conditions. At that time habitat available for foraging and nest placement will be greatly reduced or eliminated. Long-term indirect impacts to critical habitat are not anticipated based upon observations collected at these sites.

4.2 Mitigation

There are no direct impacts to this species or its nesting habitat. Piping Plovers have nested in the same two general areas within the project corridor for the last three years. Due to the Plover's ongoing nesting in these areas, MDOT is committed to a temporary work restriction eliminating all work activities between April 15 and August 31. This is a time when the birds may be nesting and rearing young within the corridor. While the Plover's are outside the directly impacted work area, it is MDOT's goal to reduce secondary impacts (noise, proximity to nest) to the greatest extent.

4.3 Monitoring

Monitoring of the Plover's in this area is currently performed by numerous agencies (MDNR, USFWS and USFS) to determine presence/absence of the species. This area will continue to be surveyed by the regulatory agencies for the entire monitoring period associated with this project. These surveys will establish whether the species exists within the project corridor and locations of specific nesting birds. If nesting territories are established the regulatory agencies will delineate the boundaries and install signs and visual fencing to educate the public and designate areas that are off-limits during nesting times. Birds that are actively nesting in the corridor will be protected with exclosures that keep predators from harming the birds or nest. Placement of these exclosures, their setup, maintenance, and removal will be determined and implemented by the regulatory agencies following Piping Plover Recovery Team guidelines.

SECTION 5

Lake Huron Locust (Trimerotropis huronia)

5.1 Impacts

The project falls to the west of Pointe aux Chenes, and locust observations encompass the entire length of the highway in sections 5, 8, 9, 15 and 22 (per MNFI mapping). Since sand blowouts extend across the highway from the foredunes, habitat for this species directly adjacent to the roadway will be impacted at intermittent locations within the project limits.

Mortality of adult locusts due to vehicle strikes had not been previously documented prior to the 2005 MDOT survey. Foraging activity and egg laying in relationship to the existing roadway and shoulders appears absent due to the lack of vegetation. Maintenance of the road shoulders and roadside ditches will push sand back off portions of the roadway, creating bare and sparsely vegetated sandy areas that may be utilized by this species. This activity maintains existing conditions that have generally persisted since the road was built through the dunes and should not result in any additional threat to the species. Observations made while walking the gravel road shoulders showed that this species avoids the graveled shoulder of the roadway except when flushed from cover. Individual locusts that were flushed from the densely vegetated sandy dune areas by the public to the paved or gravel shoulder, immediately returned to the dunes. This behavior is similar to that reported by Bland (2003) for flights of locusts that over-fly interdunal wetlands of open water.

5.2 Mitigation

Since specific mitigation measures for this species have not been identified, restoration of the vegetated dune habitat as quickly as possible seems a logical approach.

5.3 Monitoring

Monitoring for Lake Huron Locust will be conducted during the three years after construction to determine the presence or absence of the species within the excavated dune and maintenance areas planted to dune grass. The goal of the surveys will be to determine if the species has recolonized the restored areas.

A report will be prepared at the end of each year detailing the local populations, distribution, general health, and discussion of the long-term effects of maintenance adjacent to US-2. This information will be submitted to the MDNR, USFWS, and USFS for their review.

SECTION 6

Open Dune Community

6.1 Impacts

Impacts associated with this project will occur between 0-30 feet from the edge of the travel lane. These impacts are based on excavating sand and forming a ditch 18 inches deep extending approximately 7.0 feet outward from the shoulder point. The back slope of this ditch would be allowed to slump to the natural angle of repose for sand.

Construction width varies greatly throughout the project corridor. Where the side slopes are flatter, impacts are greatly reduced as the back slope will not need to be excavated to construct the ditch. Dunes that are setback from US-2 and have slopes flatter than 45 degrees will have a medium impact since only small amounts of sand will need to be excavated. Areas that contain steep sloped dunes greater than 45 degrees, adjacent to the travel lane, will have the highest impact. In these areas 10-20ft of excavation will be required from the edge of the shoulder to create the proposed ditch and stabilize the backslope at the natural angle of repose.

Approximately 20% of the project area will only require a cleanout of the existing ditch to bring it within design specifications. Another 30% of the project area will require small modifications to the backslope consisting of cutting in a few feet (low impact). Approximately 25% of the project area will require excavation work out to 10 feet from the edge of the shoulder (medium impact). The remaining 25% occurs in the high impact dune areas with steeper slopes immediately adjacent to US-2. These areas will require cuts out to 20 feet from the edge of the shoulder.

The open dune habitat in these areas is often several hundred to 1,000 feet in width. The average area that will be temporarily disturbed to create the ditch represents <5% of the overall community. The condition of the surrounding habitat within the corridor appears excellent. Natural ecological dune processes appear to be functioning and maintaining the open dune community in good overall health. No invasive plant species other than a few isolated spotted knapweed plants are present within the corridor. While USFWS have noted the species in the area, MDOT did not record any during their survey of the construction corridor. Additionally, other forms of woody encroachment do not appear to be a problem in this area.

6.2 Areas of Earth Excavation

Work shall consist of excavation of a 1.75 ft V-bottom ditch with a one on four (1 on 4) foreslope (RT), a one on three (1 on 3) foreslope (LT), and a natural angle of repose backslope that is between a one on one and a half (1 on 1.5) and one on two (1 on 2), as shown in the Preferred Alternative cross sections.

The areas of ditch construction on the south side (RT) of US-2 are as follows:

- Sta 361+51 to Sta 373+42 (RT)
- Sta 435+70 to Sta 494+56 (RT)
- Sta 564+87 to Sta 576+50 (RT)
  5150 cyd Excavation, Earth

The areas of ditch construction on the north side (LT) of US-2 are as follows:

- Sta 372+20 to Sta 462+80 (LT)
- Sta 486+70 to Sta 576+50 (LT)
  8900 cyd Excavation, Earth

6.3 Mitigation

6.31 Dune Grass Planting

Work shall consist of planting dune grass in accordance with *Section 818 of the 2003 Michigan Standard Specifications of Construction* to stabilize the areas where ditch construction has occurred, as per typical cross-sections. The grass shall be planted randomly, as per Exhibit 6.31 (Dune Grass Planting Detail), along the proposed backslope of the "V" bottom ditch across from and above the shoulder hinge point to the top of the proposed backslope, as per typical, and in any other areas where natural vegetation has been disturbed from the construction of the ditch.

6.32 Sand Fence

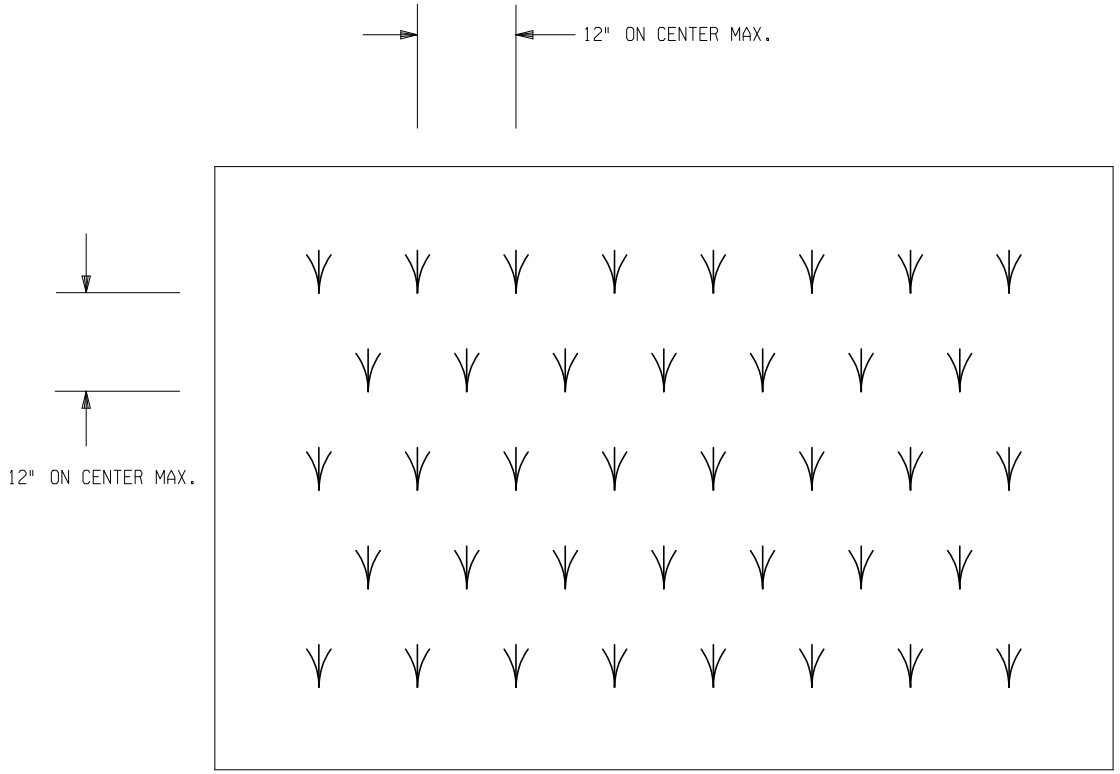
Work shall consist of placing Sand Fence in accordance with *Section 208 of the 2003 Michigan Standard Specifications of Construction* to stabilize the areas of ditch construction, as per Exhibit 6.32 (Sand Fence Detail). Sand Fence will be placed within MDOT ROW, as directed by the Engineer, and left in place until natural stabilization has occurred. Approximately 15,000 feet of Erosion Control Sand Fence will be included in the plans for use as directed by the engineer.

6.33 Construction Staging

Dune grass planting shall occur no more than three days after ditch excavation is complete or per MDEQ permit conditions.

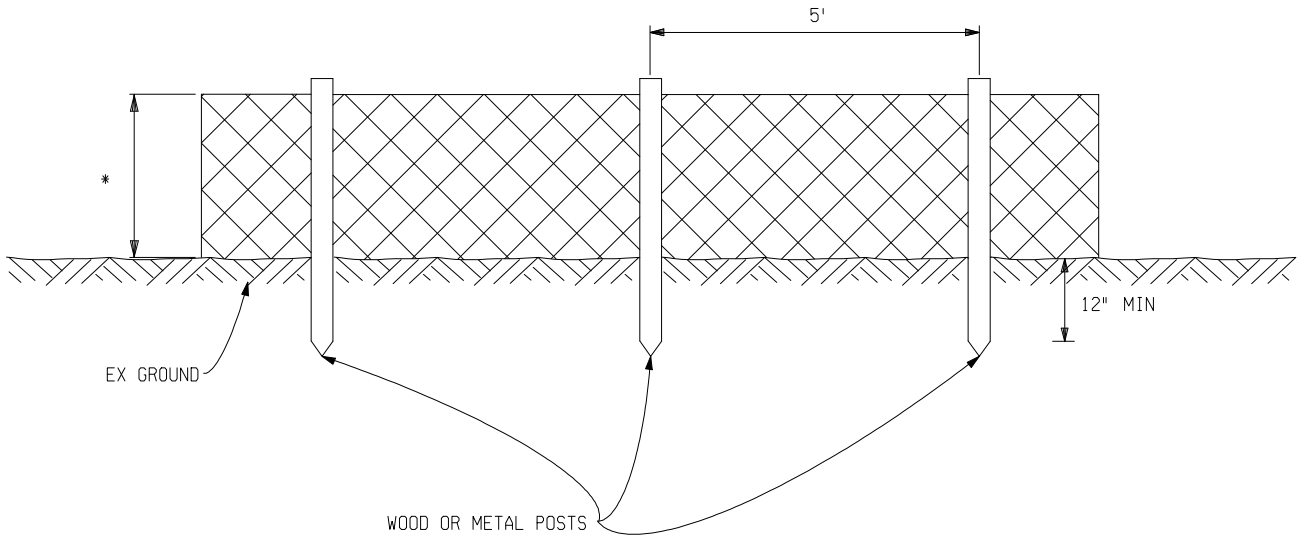
6.34 Contingency Plan

The following items of work shall be done in necessary maintenance situations that arise from the ditch backslope becoming unstable due to natural movement of the sand during the life of the project. Items of work to stabilize trouble areas shall include additional dune grass planting, watering, compacting, erection of temporary sand fence, placement of mulch blanket, and additional earth excavation where ditches have become filled in.



DUNE GRASS PLANTING
PLAN VIEW DETAIL

Exhibit 6.31
Dune Grass Planting Detail



EROSION CONTROL
SAND FENCE DETAIL

* RECOMMENDED 30" (MIN) TO 48" (MAX)
AS APPROVED BY THE ENGINEER

Exhibit 6.32
Sand Fence Detail

SECTION 7

Mitigation and Monitoring Plan

7.1 Mitigation and Monitoring Plan

The attached consultant services scope of work (US-2 Monitoring Dune Restoration Planting) will provide additional information regarding the inspection and monitoring program for the dune restoration activities. Also included within that plan is the Invasive Plant Species Control Plan for all excavated areas within the project corridor.

US-2 Monitoring Dune Restoration Planting
Consultant Services Scope of Work

1. Inspection and Monitoring Program

The project will implement an Inspection and Monitoring Program similar to the program termed Effectiveness Monitoring used for previous critical Dune Stabilization along US-2. The monitoring program will begin immediately after construction is completed which is anticipated to be approximately November 30, 2007. The primary areas of monitoring will be located on the south side of US-2 at three locations. The locations are 1) Station 361+51 to Station 373+42, 2) Station 435+70 to Station 494 + 56 and 3) Station 564 + 87 to Station 576 + 50.

The monitoring program for this project will involve a series of repeated, standardized observations and data collection activities (measurements, photographs) at 10 pre-established 10 foot by 10 foot monitoring stations which will be located, flagged and photographed as a baseline at the end of the construction phase of the project.

In addition to evaluating the conditions at the permanent monitoring stations, the monitoring program includes an overall assessment of the entire planted area. This assessment provides an overview of the condition of the restored dune face, the condition and distribution of the planted beach grass, the use of access ways, erosion and drainage control issues, and general invasive species occurrence.

Attachment "A" outlines a performance schedule. This schedule outlines inspections and monitoring activities over a five-year period, Spring 2008 to Spring 2013.

The need for additional monitoring/maintenance beyond the fifth year will depend on the success of the stabilization treatments up to this period. A minimum survival rate of 50% of the planted vegetation as measured over the entire site must be achieved before the stabilization of the dune will be considered a success. After consultation with MDOT, MDEQ and USFS, additional monitoring may be required.

2. Invasive Plant Species Control Program

The MDOT has a concern for the invasion of exotic weed species into areas that have been recently disturbed. Most weed species are opportunistic and will establish themselves in environments that offer disturbed soils. The dune restoration activities completed in the project provides such an opportunity.

The MDEQ is committed to protect critical habitat including sand dunes from invasion of exotic weed species. In particular, they are sensitive to the opportunity that the stabilization activities in the sand dune environment have created for the establishment of unwanted exotic weed species. The MDOT will control the establishment of invasive plant species during the five-year establishment period.

Below is a list of MDEQ's invasive plant species of concern.

Brome grass	Bromus inermis	Perennial
Spotted knapweed	Centaurea maculosa	Biennial
Canada thistle	Cirsium arvense	Perennial
Bull thistle	Cirsium vulgare	Biennial
Ox-eye daisy	Chrysanthemum Leucanthemum	Perennial
Baby's-breath	Gypsophilia spp.	Annual
Chickweed	Stellaria spp.	Winter Annual
Non-native spurges	Euphorbia spp.	Perennial
Hawkweed	Hieracium spp.	Perennial
Wild lettuce	Lactuca spp.	Biennial
Bouncing bet	Saponaria officinalis	Perennial
Bladder campion	Silene vularis	Biennial
Clover	Trifolium spp.	Perennial
Alfalfa	Medicago spp.	Perennial
Bluegrass	Poa compressa	Perennial

An invasive plant species control plan must be based upon several components. The first is the identification of invasive plant species within the project area. A second is an understanding of their biology. And the third component is the selection of an appropriate control technology.

Plant Identification

During the 2001 year of inspection and monitoring of a similar location, invasive plant species were not found to be in over abundance. The most prominent, Spotted Knapweed, was primarily found along the US-2 roadside shoulder and in a few locations within the previously constructed ribbon dunes. The overall infestation within the project area appeared small. Some of the other invasive plant species listed above may have been present but were not readily visible during the periodic site visits undertaken in 2001. A systematic search of the project area, as being outlined in this control plan will confirm the presence or absence of the listed invasive plant species.

The weed species listed above, include plants that have annual, winter annual, biennial and perennial life cycles. As such, their form and appearance vary with time of year and from year to year. Experienced observers can locate and identify plant species during any time of year that the plants are visible to the observer. Knowing the biology of the specific plant aids in developing a strategy to identify the presence of a species of concern and to allow collection and disposal of it. Knowing how the plant reproduces and where in its life cycle reproduction takes place, are also important characteristics to understand. The invasive plants listed above, represent plants that reproduce by seed only, primarily by vegetative means to plants that reproduce equally well by both seed and vegetative means.

It is fully anticipated that a spring site walkover will identify the presence of old dead remnant non-native weed residue and / or vegetative root crown growth of winter annual, biennial and perennial plants within the stabilized dune environment. Remnant plant residue, is many times

easily identifiable to species, where the crown growth in the early spring is more difficult to locate and to identify to species. As the growing season progresses, crown ring buds re-sprout and sent up bolts (shoots), while annuals seeds germinate and perennial plant root buds sprout new vegetative growth. As this vegetative growth continues over the next weeks and months, the identification of plant species becomes easier and more rapid. Likewise, as the growing season progresses, flowers are formed, they blossom, and the plants identity is again more apparent. It is this cumulative information that will be used by the Vendor to form the basis of a monitoring program to identify invasive plant species in the project area for this control plan.

Control Methodology

Varying techniques have been used for controlling invasive plant species for many years. In recent times, an integrated pest management approach to the problem has been successfully used. Within this concept, the resource professional selects control techniques that comply with the regulatory requirements of a treatment technology, and pest management needs of the problem species. In the arsenal of today's modern resource manager, physical (manual/mechanical/fire), chemical, cultural, and biological technologies can be used singly or in combination to achieve site-specific goals. In the case of the MDEQ regulated Critical Sand Dune Habitat in which the project area is located, the statutory nature of the dunes controls the type of pest plant management techniques like prescribed burning and mowing will not be permitted. Biological controls are possible but the nature of the dune stabilization activities calls for a more rapid response to the possible establishment of weed species in the newly disturbed dune stabilization area.

In our case, cultural forces are also not a significant factor in the possible short termed establishment of invasive plant species in the newly disturbed dune environment. The most logical technique to be used within the regulated dune environment is low intensity, manual actions, i.e. hand removal (pulling and digging) of identified invasive plant species. This type of approach is ideal for application here because it is easy to plan, the number of invasive species is small, manual control techniques should be readily effective and the need for control is relatively short-term in nature. Hand removal can be, however, labor intensive.

The Plan

Control activities for this project will be divided into a monitoring procedure and a removal procedure. The monitoring procedure will include a thorough site walkover of the stabilization area. For the purposes of this plan, Vendor will limit its walkover to the area within the designated areas on site. Walkover activities will be confined to patrolling the restored dune area and trafficking the un-vegetated open areas, when at all practical. This method of travel within the dune environment to identify invasive plant species will assure that the impact upon dune vegetation will be kept to a minimum or avoided all together. Likewise, disturbance of the dune sand and unnecessary compaction of the soil will also be avoided.
During the walkover, the Vendor observer will identify the presence of any invasive species listed in Attachment X. These plants will be marked with a numerically identified flag for removal. Once flagged, the location will remain flagged for the duration of the control project. The long-term marking of a removal site will allow for easy relocation of the site and ensure that

any re-occurring vegetative growth of latent seed germination of invasive plant species that takes place between spring and summer monitoring and removal periods will be addressed in future removal procedures. In many instances, removal actions at any one location may need to be administered several times to prevent weeds from becoming reestablished.

The removal procedure will be where the individually identified invasive plant is physically collected, bagged, and properly disposed of. The selected technique for removing plants from the project area will be manual pulling. Pulling can be particularly effective for annuals and tap-rooted plants. However, pulling is less effective for perennial species with deep underground stems and roots that may be left behind after pulling or uprooting activities. Thus, manual removal activities require persistence over time to be successful. Collection will in most instances, require that a small digging tool be used to excavate the plant including the rootstock and aerial growth parts including flowers and / or seed heads. It is very important to remove all of the plant, when at all practical. In some cases, this will require digging to a depth of 6 to 12 inches or more, to assure that as much, if not all, of the root system of the invasive plant is removed. If not completely removed, the rootstock will simply allow plant regeneration at a future time.

Likewise, once seeds are dispersed, they can only be addressed after they have germinated over the next several seasons. Therefore, incomplete removal practices are not only inefficient use of labor but would be self-defeating in the goal to control invasive plant species in the project area.

Once a plant has been collected, it will be placed into a large, 55-gallon sized paper bag or equivalent. When the bag is full or collection is concluded, the bag will be securely closed, sealed, and transported to a designated site for proper disposal. Collected plants will either be incinerated or disposed of in a deep compacted, clay-capped landfill.

Some invasive plant species have a reputation of exuding irritating fluids, as well as being physically harsh on unprotected skin. As such all collectors will be issued gloves to protect their hands during removal activities. Likewise, collectors will be encouraged to wear long sleeve shirts and long pants to protect against cuts, abrasions, and irritations from the plant material being handled during removal activities.

Prior to any field activity, all monitoring and collection staff will be trained/educated by Vendor, as to the proper identification of those weed species listed in Attachment X. Staff will be provided necessary training in the collection, removal, bagging and disposal of the invasive plant species. Experienced Vendor staff will always be present to supervise field personnel during the identification and removal activities for the invasive plant species control plan within the project area.

Monitoring and removal records will be kept for the proposed control program activities. Vendor will create a standardized form to allow consistent data to be gathered and recorded. The form will include information such as name(s) of persons performing the monitoring or collecting activities, the location/site number of the activity, the date of the activity, weather conditions, what plant type and species was found and/or removed, stage of growth, size of patch

encountered and / or number of plants, and the removal techniques used. The form will also allow for any special observations or notes to be gathered.

Vendor personnel will undertake the primary monitoring and removal procedures outlined above. The use of any non-Vendor would be on an as needed basis and would be selected based upon consultation with MDOT. Monitoring and removal procedures will take place over each of the next five years (2007 and 2012). The first control cycle will be in the spring of the year, i.e. May. The monitoring activities in the spring will take place typically between May 1 and May 10. The removal activities will take place typically between May 10 and May 15. During this time period, the effort will concentrate on the identification and removal of old dead remnant residue non-native weed plants previously listed. Although many plants will have fully dispersed their seeds in the fall of the year, the action will eliminate the dispersal of any remaining seeds from plant seed heads that made it through the winter. Removal will also involve the identification and removal of root crown growth or possibly early bolts or a few of the early flowering invasive plant species.

The second time period of each year that the monitoring and removal procedures will be implemented will be in July. This time frame will find most of the invasive plant species in a growth stage that they can easily be identified, but yet at a time before most of the plants have matured and produced seed heads, which are ready for seed dispersal. Plant identification at this time is also timely to eliminate those plants that spread by vegetative means or were not detected in the root crown stage of growth.

In the summer program, it is anticipated that the monitoring activities on site will take place between July 1 and July 10. The removal activities will be scheduled to take place between July 10 and July 15.

Program Success Criteria

Success of this invasive plant species control plan will be based upon a visual assessment of the project area at the end of each growing season (five-years of total monitoring). A successful control program will be where, at any one location within the project areas, an observer will see at least 95% of the permanent program monitoring stations, identified in section1(Inspection and Monitoring Program), be used as the locations to make the visual assessment success observations.

ATTACHMENT - A
US-2 Monitoring Dune Restoration Planting

Initial Planting (November 2007)

Growing Season (April – September 2008-2013)

Additional Planting of Dune Grass (April 2008)

Observations Once Every Other Month (April – September 2008)

Access Way Use / Effectiveness Evaluation

Planted Surface Evaluation

Natural Regeneration Assessment of Resident Plants

Control Zone Evaluation (Monitoring Station)

Identification and Removal of Invasive Plant Species

Recommended Adjustments to Site Treatments

Consultation with Agencies

Implementation of Adjustments

Compliance Status / Report (Detailed Report on Five (5) Observation Factors listed above.)

Fall Maintenance Period (October – November 2008-2013)

Access Way Changes

Additional Planting (If needed)

Removal of Invasive Plant Species

Determination of Treatment Success

ATTACHMENT "B"
US-2 Monitoring Dune Restoration Planting

MONTHLY PROGRESS REPORTS

The first two pages of this attachment are the necessary layout of the Monthly progress reports and the last three pages are a completed example.

Control Section 00000
Job Number 00000C
Structure Number S00
Date 00/00/00

MONTHLY PROGRESS REPORT

A. Work accomplished during the previous month.

B. Anticipated work items for the upcoming month.

C. Real or anticipated problems on the project.

D. Update of previously approved detailed project schedule (attached), including explanations for any delays or changes.

E. Items needed from MDOT.

F. Copy of Verbal Contact Records for the period (attached).

Appendix D

Maintaining Traffic Plan

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
MAINTAINING TRAFFIC

a. Description.- This work shall consist of all labor, materials and equipment required to maintain traffic in accordance with the Special Provisions for Maintaining Traffic, and as specified herein for the JN 77191 of CS 49023 on US-2, Moran Township, Mackinac County.

b. General.- Traffic shall be maintained according to Sections 103.05, 103.06, 812 and 922 of the *2003 Standard Specifications for Construction*, including any Supplemental Specifications, and as specified herein.

1. The Contractor shall notify the Resident Engineer a minimum of 3 full working days prior to the implementation of any lane closures and major traffic shifts.

2. The Contractor shall coordinate his operations with Contractors performing work on other projects within or adjacent to the Construction Influence Area (CIA).

3. MDOT maintenance crews and/or Contract Maintenance Agencies may perform maintenance work within or adjacent to the Construction Influence Area (CIA). The Maintenance Division of MDOT and/or Contract Maintenance Agency will coordinate their operations with the Resident Engineer to minimize the interference to the Contractor. No additional payment will be made to the Contractor for the joint use of the traffic control items.

c. Construction Influence Area (CIA).- The CIA shall include the right-of-way of the following roadways, within the approximate limits described below:

1. On US-2, from approximately 3500 feet west of the P.O.B. to 3500 feet east of the P.O.E.

d. Traffic Restrictions.-

1. Two way traffic shall be maintained at all times on US-2 using traffic regulators. A traffic regulating sequence will be allowed to cover a maximum of 1 mile. The arrow panel, signs and channelizing taper for the traffic regulating operation shall be placed at locations approved by the Engineer for adequate visibility by oncoming traffic.

2. No more than 1 traffic regulating operation shall be permitted at one time on US-2.

3. Lane closures will not be permitted from the end of the normal work day on Thursday to the start of the normal work day on Monday.

d. Traffic Restrictions.- (cont'd)

4. No more than 1 single lane closure or shoulder closure shall be permitted at any time.

5. The Contractor shall notify the Engineer at least 24 hours in advance of erection or removal of overlays on existing signs.

6. All work shall be conducted during daytime hours only.

7. During construction, access to all residential and commercial drives shall be maintained.

8. When a lane or part of a lane is closed the speed limit shall be set at 45 miles per hour and the R2-1's shown on the attached typicals shall reflect this speed.

9. Access for construction vehicles between traveled lanes and work areas will be restricted to specific locations. The number of access points and their locations will require the prior approval of the Engineer.

10. Once work is initiated that includes any lane restrictions, that work shall be continuous until completed. A lack of work activity for more than 1 week will require the removal and replacement of lane restrictions at the Contractor's expense unless approved by the Engineer.

11. Additional traffic regulators used at unsignalized intersections and driveways, as directed by the Engineer, shall be included with the Flag Control pay item.

12. No lane closures or traffic regulating sequences will be allowed where the contractor can accomplish the work utilizing a shoulder closure. Lane closures and flagging operations will be allowed only in areas and situations deemed necessary by the Engineer.

13. In areas where sight distances are limited, the beginning of the lane closures or placement of traffic regulators may be adjusted for adequate visibility as directed by the Engineer.

14. When utilizing a shoulder closure, the Contractor's personnel and equipment shall not occupy any part of the active traffic lane. If this situation cannot be avoided, then a lane closure sequence shall be used.

15. Traffic delays of longer than 10 minutes will not be allowed. Traffic backups of more than 1 mile will not be allowed. If either of these conditions occur, construction operations will cease while traffic flow is being addressed and brought back into an acceptable condition. There will be no additional compensation made to the contractor for delays in construction due to the monitoring and handling of traffic backups.

e. Traffic Control Devices. -

1. General

   A. All traffic control devices and their usage shall conform to the most current revision of Part 6 of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD), 1994 edition. The most current revision of Part 6 of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD), 1994 edition can be found at the following website:

   http://www.michigan.gov/documents/mmutcd_part_6_16693_7.pdf

   B. During non-working periods, any work site with uncompleted work shall have advance signs (W21-4 - "Road Work Ahead") and lighted plastic drums, at specific locations, as directed by the Engineer, at no additional cost to the department.

   C. Sign covers shall be placed over existing regulatory, warning and construction signs that are not applicable during construction. Payment for covering existing signs shall not be made separately but will be considered to be included in the pay item "Maintaining Traffic".

   D. Signs, barricades and plastic drums when required by the Engineer, are to be cleaned over the entire reflective surface.

2. Temporary Signs

   A. All signs shall be approved by the Engineer PRIOR to use.

   B. Signing for G20 series shall be as shown on attached Figure M001ae.

   C. Signing for shoulder closures shall be as shown on attached Figure M002e.

   D. Signing for a single lane closure utilizing traffic regulators shall be as shown on attached Figure M004e.

   E. All temporary signs shall be 4 ft by 4 ft diamond shaped mounted at a 5 foot minimum bottom height in uncurbed areas.

   F. Distances shown between construction warning, regulatory and guide signs shown on the typicals are approximate and may require field adjustment, as directed by the Engineer.

   G. All temporary signs shall be constructed with legends and symbols flush to the signs face and not extending beyond the sign borders or edges.

e. Traffic Control Devices. – (cont'd)

H. All temporary signs that will be in place for more than 14 days shall be mounted on driven posts.

3. Channelizing Devices

A. Channelizing devices used during daytime shoulder closures, or lane closures shall be lighted plastic drums with high intensity sheeting.

B. Eighty five (85) lighted plastic drums are included to be used at the discretion of the Engineer.

f. Measurement and Payment.- The estimate of quantities for Maintaining Traffic, is based on signing and related traffic control devices for one (1) shoulder closure, one (1) single lane closure, one (1) signing treatment for G20 series, four (4) "SPEED LIMIT 45" (R2-1). This estimate also includes a maximum of two (2) Type C lighted arrows (min 48in by 96in) to be in use at any one time.

1. Payment for temporary signs shall be made on the maximum square foot of dissimilar sign legends in use at any one time during the project.

2. Any additional signing or maintaining traffic devices required to expedite the construction shall be at the Contractor's expense.